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Volume 6 Number 12



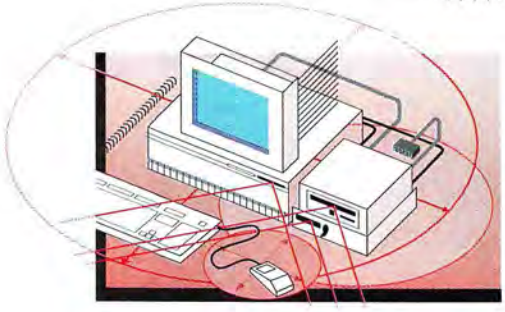
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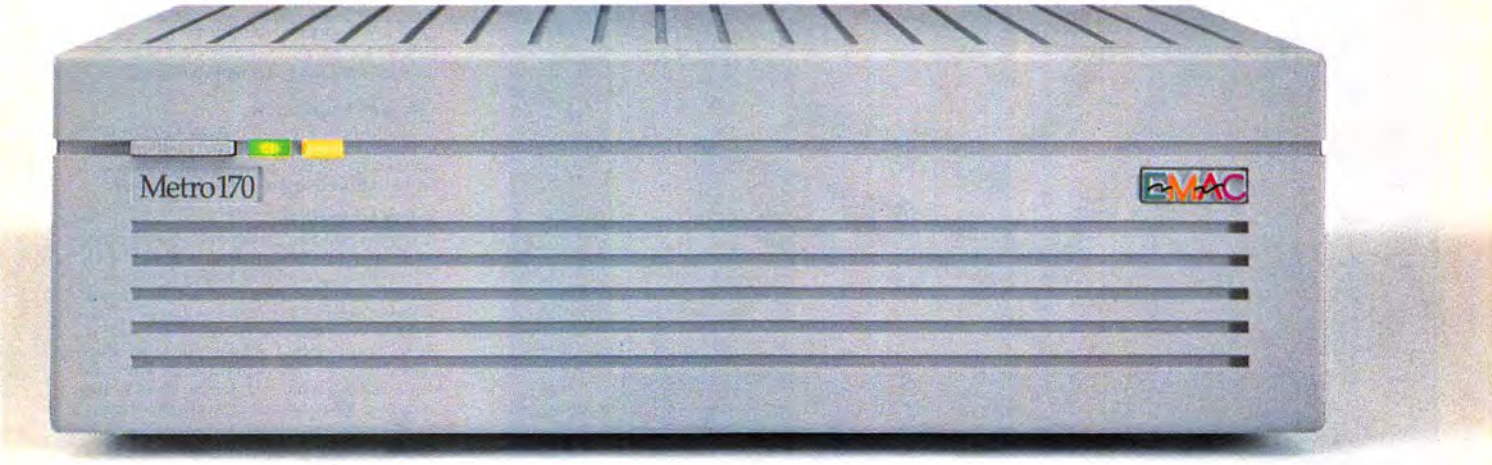
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About **MacUser**

Double Jeopardy!

Bob LeVitus is an ace when it comes to finding the answers. If you've read our monthly Help Folderful of questions and answers, you've seen him come up with answers on everything from QuickDraw to slow SCSI. And if you've read his best-selling book *Dr. Macintosh* or his new *Stupid Mac Tricks*, you know that — no matter how profound or how trivial the questions — he's the man with the answers.

But is he the man with the questions?

This question was put to the test last August, when Bob represented *MacUser* in the first BCS (Boston Computer Society) showdown of Macintosh journalists, industry insiders, and just plain folks in a game of Macintosh Jeopardy! — a takeoff on the ever-popular TV quiz show, in which the moderator provides the answers, the players provide the questions, and the sponsor provides a silver-plated bowlful of Twinkies and Coke Classic to the winner.



A: Dynamic duo of dead-on data.
Q: Who are Andy Ihnatko (left) and Bob LeVitus (right)?

The questions tested the contestants' knowledge of Mac trivia, their speed with a buzzer, and their ability to bluff their way out of a paper bag. To nobody's surprise (not ours, at least), Bob won the trophy, and he also got something even better: a partner. Andy Ihnatko, one of BCS' noted Mac experts and a cocreator of the Macintosh Jeopardy! event, has now joined Bob in answering your questions every month in Help Folder. Andy's the kind of guy who spends too much of his time memorizing *Inside Macintosh* — at least, he used to until he got fed up because it wasted so much space on pictures.

Andy doesn't, as he puts it, "have a big-time book contract or anything," but he does have an encyclopedic knowledge of the Mac. And he's got something even more valuable: an attitude. Actually, that should be Attitude, with a capital *A*, as in "rap is just opera with an Attitude." Check out this month's Help Folder if you want help in redefining *Attitude*.

Not content to be merely an answerman, Andy is also adept at eliciting questions. He's enjoyed some notoriety at BCS meetings by leaving an innocuous *Star Wars* Jedi lunch box, in which members can anonymously leave questions that they might be too embarrassed to ask aloud, by the door of the meeting room. Questions such as "OK, I know Apple says there are no user-serviceable parts inside the computer, but does it violate my warranty if I read *Inside Macintosh?*" Often enough, the answers aren't as trivial as the askers fear.

So don't be shy — send us your questions. We don't have a Jedi lunch box, but we do have the most expert duo since Masters and Johnson waiting to answer all your questions. (If you think you've already got all the answers — and questions — test your wits in the Macintosh Jeopardy! sampler sidebar, "More Than You Know?" in "Our Readers Write Back" in this issue.)

The Mac SQL Sequel

The first SQL database for Macintosh has enhanced connectivity and a new graphical Query Tool.

The first version of ORACLE for Macintosh was a big hit. Industry analysts gave it a thumbs up. Thousands of users gave it their support. And InfoWorld Magazine gave it Product of the Year.

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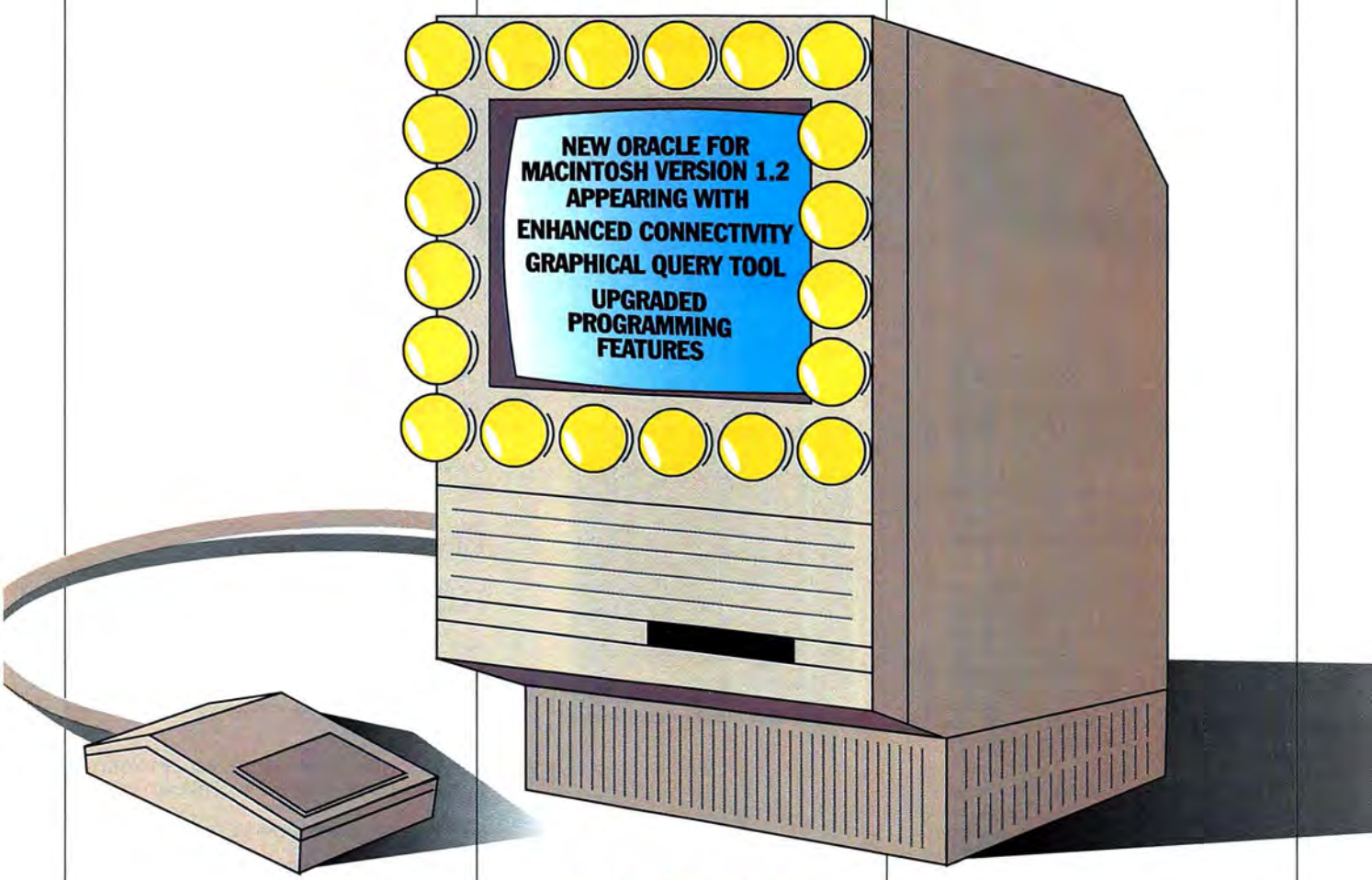
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LETTERS



If Mac owners have a secret shame (other than what they paid for memory two years ago), it's the frequency with which their computers crash. Rae Schauer of Milligan College, Tennessee, was typing a final research paper due the next morning when "the Mac froze and I had to turn it off. When I got the system back up, six pages of my paper were locked in a MW0000 file, which wouldn't open. Somewhere inside my stressed head a light popped on, and I remembered that I had read about this problem in Help Folder. I hunted through my back issues and found the solution."

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Portable Opinions

John Rizzo's article "Have Mac, Will Travel" (September '90, page 192) was well written, but the idea of purchasing a DOS laptop computer for use as a "data bucket" deserves the conspicuous-consumption-of-the-year award. Spending more than $1,000 for a computer is silly if all you intend is to "fill 'em up, carry 'em home, and empty 'em into your Mac." If that's all you want, you'd be better served carrying a box of disks, or a portable hard-disk drive if you need the megabytes. If you purchase a DOS laptop, do it for the right reason: Use Microsoft Word, WordPerfect, Excel, or any of the other programs that run on both Macs and PCs, and get some productivity from your investment by working with the same programs on both computers and swapping formatted, compatible files as needed.

Geoff Hart
Sault Ste. Marie, Ontario
Canada

I must take issue with your September '90 evaluation of portable Macs in the article "Have Mac, Will Travel" by John Rizzo. Although I agree generally with the trade-offs he mentions, it's my opinion that the best portable Macintosh is the Outbound Laptop System. The others are "luggables" at best and have severe deficiencies. The Dynamac SE/30 is ruled out completely because it is not a battery-driven machine.

Although the Macintosh Portable is a splendid machine, it has two significant drawbacks. The first is that it is indeed a luggable; after a few attempts to use it on flights and other modes of travel, I put it into a hard-shelled suitcase and shipped it with my other baggage. By contrast, the Outbound fits very nicely into my briefcase.

The second point is that the Macintosh Portable's screen is absolutely dismal unless you are working in a brightly lit office environment. This type of environment does not exist on the road. I am delighted with the Outbound screen, which I can use in a completely dark room.

To me there's no comparison. The Outbound is clearly superior to the Macintosh luggable and the Dynamac transportable.

Gerald W. Matthews
Orlando, FL

As I mentioned in the article, I too have used all four machines in airplanes, trains, cars, and buses. The Outbound Laptop System has too many shortcomings for the price. To reiterate, the Outbound's Isopoint is hard to use, the battery doesn't last on a coast-to-coast plane trip, and the screen-redraw rate is slow. In addition, our tests showed that the

Dear Mr. Sculley . . .

. . . When we asked for "insanely great" ideas that might keep Apple ahead of the pack, did we really expect our readers to perform the function of high-priced analyst types for free? Of course — we weren't disappointed either. Tom Capizzi, of Cincinnati, Ohio, thinks Apple should "steal a trick from IBM a few years back — sell a *lot* of machines *below cost*. The reason is obvious — everything else to run the system would have to be bought at regular markup!" Let's hope not — otherwise, next thing you know, Claris will be selling System 7.0.

"I'd like to see larger screens on all the Mac models," says Andrea Barol, of Philadelphia, Pennsylvania. "Computers priced at the SE level with large screens would be a terrific seller." Sounds like the thinking behind Apple's just-announced Macintosh LC. And speaking of new CPUs, Apple might consider Andrea's other suggestion: "A terrific incentive for consumers would be a buy-back program. More users would seriously consider upgrading to a faster, newer computer immediately, if they could trade in their older models."

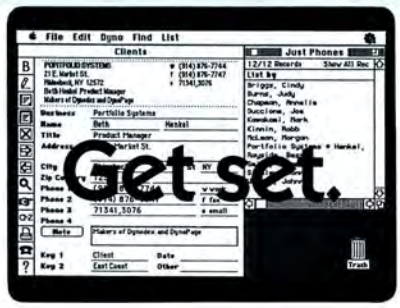
We recognized another prescient voice in Robert Eikel, of La Jolla, California: "What insanely great idea could keep Apple ahead of the pack? A simple one: voice recognition. I'm not talking about the difficult-to-develop fully voice-operated Mac system, just a microphone that replaces the keyboard. Something this simple could be brought to market very quickly." Robert's right about its being developed quickly — it's already hear, er, here.

By now you've heard the news: Apple's bringing sound to the Mac in a big way. Annotation, voice mail, speech recognition, the works.

Speak Up: Sound on the Mac — is it a bang or a whimper?

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LETTERS

Outbound is slower than the Mac Portable and isn't completely compatible with all Mac software.

The real issue is cost. If you don't need fancy features such as a trackball, hard- and floppy-disk drives, and real SCSI and if weight is your main concern, I still recommend a DOS portable, which you can get for several thousand dollars less than an Outbound (not counting the Mac Plus or SE you have to disable). — JR

Singapore Sting

Guy Kawasaki is a pretty neat person. I read and enjoyed his book, and he did a swell demo at my user group when he was flogging 4th Dimension.

I realize he appreciates well-run organizations, but his praise of Singapore ("The Singapore Way," October '90, page 41) was a bit much. Singapore is governed by a fascist dictatorship. Its citizens barely have any freedom of speech as we know it or other little things such as due process or opposition political parties.

I'm glad Guy had a ball in Singapore. He'd probably have enjoyed Mussolini's Italy too. After all, didn't Mussolini make the trains run on time? Good pasta too.

I'm disappointed, Guy.

Richard Pachter

Boca Raton, FL

I wanted to be among the first to tell you how much I enjoyed Guy Kawasaki's tongue-in-cheek article "The Singapore Way." As a Singaporean, I was tickled pink to read about his favorable impressions of Singapore and the Mac scene over there. It was refreshing to read something different, instead of the usual Singapore-bashing reviews that you often read in articles about the island and its political system.

In any case, Singapore is determined to be a major player in the global information-technology marketplace. Soon, not only will there be computers in offices, schools, and homes but they also may all be linked. Already all the schools are linked to the Ministry of Education. When all the computers in the island are linked, think of the incredible power that information sharing will bring. First Singapore, next the world!

John Heng

San Francisco, CA

Love Apple

Apple's behavior last year in temporarily raising prices cost the company a lot of goodwill. For the first time, Mac users realized that Apple might try to profit at their expense.

Now we have to make a decision. Are we going to ". . . Hate the Company, but . . . Love the Machine," as was jokingly suggested in October's "Dear Mr. Sculley" (Letters, page 14)? The rightful action is one that makes the community stronger, and in most cases, destroying members of the community makes it weaker. Hating Apple is self-defeating. Without Apple, there is no machine.

For Apple to succeed in a way that works for the community of Mac users is in all our interest. *MacUser* can be a leader by knowing how to ask the tough questions while still showing that it wants Apple to succeed. If Apple screws up, we need to tell it — not to destroy it but to stop it from screwing up.

Vik Rubenfeld

Manhattan Beach, CA

Love it or hate it, Apple must be listening to someone — *check out "Three Cheers for Three New Macs" in this issue to read about the lowest-priced, most-bang-for-the-buck Macs ever — in addition to price cuts on the SE/30 and IIci. — JR*

Ticked Off

In "EtherTalk-to-LocalTalk Routers" (Buyer's Guide, June '90, page 42) you evaluated several AppleTalk-to-Ethernet gateways, including the Cayman GatorBox running GatorSystem version 1.4.1. The article recommended the GatorBox for NFS file sharing and other high-level gateway features but did not recommend it for straight LocalTalk-to-EtherTalk routing, owing to speed and consistency problems that were indicated by your test results.

At Cayman, we have run your tests and learned that, under certain conditions, the version of GatorSystem you tested indeed routes packets more slowly and less consistently than do other vendors' routers. However, our testing determined that the differences in speed and consistency are usually too small for users to perceive.

The results you presented contradict this because your tests contained a serious flaw: You used ticks instead of a reliable clock to measure elapsed time. Tick counters offer a convenient way of measuring elapsed time on a Mac, but they are not reliable enough for performance tests that exercise the Macintosh AppleTalk driver, because this driver

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interferes with the tick-counter mechanism. As a result, using ticks for running the comparison tests makes slightly faster routers look very fast and slightly slower routers look very slow. This method causes minor differences in relative performance to appear significant, when in fact users cannot tell the difference in actual use. We were glad to see that our data confirmed what our customers have been telling us. We look forward to your next lab on EtherTalk-to-LocalTalk routers. But please, *MacUser*, next time stay away from ticks!

Eric Janszen
Product Marketing Manager
Cayman Systems
Cambridge, MA

We apologize for the error in our test procedure and for any negative impression of the GatorBox that we may have created as a result. Who would've thought we'd be bitten by a tick? We appreciate the opportunity to improve our test suite. We have already begun work on a follow-up router lab report; we encourage readers to watch for it. —HB

Don't Do Windows

Over the past few months, I've been reading articles and editorials about Windows 3.0 and how poorly it compares with our Mac environment. Why? I think most of us already know what an exceptional platform the Mac is. If Windows 3.0 is neither a threat nor an Apple product, why am I wasting my time reading about it in your magazine?

Rich C. O'Brien
San Diego, CA

Sure, you know that Windows is not a threat. And we know that Windows is not a threat. But do all the people who sold their Apple stock after the Windows 3.0 announcement know? —JB

I read with interest your speed comparisons of Windows 3.0 and various Macintosh configurations ("Windows 3: The PC to Be Your Best?," September '90, page 222). In particular, you compared an 8-megahertz Mac SE with a 10-megahertz 80286-based machine and a 4-megabyte 16-megahertz Mac IIcx with an 8-megabyte 25-megahertz 80386-based machine. Part of the reason the Mac may not have fared so well in the processor-intensive tests could be that, except for the Mac IIfx, all the Mac configurations ran at a slower clock speed than did the PCs you were comparing them with. Furthermore, in the test comparing the IIcx and PS/2 Model 80, the IBM machine was equipped with twice as much RAM as the Mac was. I would have considered this a fairer test if it had compared a Mac SE and an 8-megahertz 80286 machine (if you could find one). A more formidable challenger to the IBM PS/2 Model 80 would have been a Mac IIci. I wish you would consider redoing your IIcx-versus-Model-80 benchmark — this time with an 8-megabyte IIci.

Sonny Shrivastava
Danville, CA

You're right, we did stack things against the Mac. Our intention was to compare machines in similar price ranges — not machines of similar power. Despite our approach, the Mac still proved to be the better performer overall. —JR

Yes, I Scan

Our thanks to Ron Hipschman and MacUser Labs for their informative review of hand-held scanners ("Hand-Held Scanners," September '90, page 167). We would like to clarify a couple of points. Here are LightningScan's correct specifications for three items in Table 6 (page 190):

- Scaling range: 25 to 100 percent.
- Resolution: True 400 dpi, not interpolated as stated.
- SCSI-box dimensions for LightningScan 400: 8.25 x 6.25 x 2.3 inches.

Our $189 upgrade mentioned on page 172 applies only to users of our original version of LightningScan — not to ThunderScan. However, ThunderScan users can contact Thunderware directly to obtain special pricing on the LightningScan 400.

Brian Smith
Thunderware
Orinda, CA

A Missing Dialog Box

When transferring the same file back and forth between two Macs, I have several times lost the latest edition of that file. I really do need a dialog box such as that in Figure 1. Will Apple create this

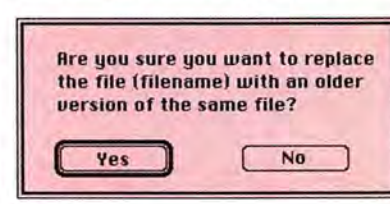


Figure 1

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dialog box with System 7.0, or is there a utility that can do this for me?

Per G. Wyholt
Göteborg, Sweden

Sorry, we know of no such plans for System 7.0 nor of a utility that will do what you describe. We've got a name if a French-speaking hacker wants to write one, though: LaTest. — JB

Powerful UltraPaint

We at Deneba Software are pleased that you reviewed UltraPaint (September '90, page 69), but there were several inaccuracies that *MacUser* and its readers should be aware of.

Your reviewer noted a redraw problem that covered up the Layer Manager. This bug occurred in a beta version but was corrected in the shipping version. The cursor's behavior of changing colors is not a bug but rather a legitimate method of displaying the cursor (also used in Studio/8 and PixelPaint) to maintain optimum visibility.

Your reviewer mentioned the blinking cursor as a product-specific flaw. This phenomenon is not unique to UltraPaint; it occurs under the same conditions in PixelPaint, Studio/8, Digital Darkroom, ImageStudio, and SuperPaint.

Contrary to your reviewer's statements concerning complexity and clutter, we do not believe that users must sacrifice clarity to access all of UltraPaint's power. Total control can be obtained with only three windows open, and the tools are both fewer and more distinct than the reviewer states. (The free-form tool and pencil, for example, are not the same. The free-form tool creates Bezier curves and polygons; the pencil edits pixels.)

These inaccuracies, as well as others, have led us to conclude that your readers deserve a fairer and more accurate representation of UltraPaint.

Joaquin de Soto
Vice President
Deneba Software
Miami, FL

We regret giving the impression that many problems that appear in Mac paint programs are UltraPaint-specific problems. At the same time, we're glad to see that the legitimate bug mentioned in our review (the problem with copy and paste) has been corrected. Whether UltraPaint's interface is too cluttered is a largely subjective issue, but we're willing to reiterate our reviewer's opinion that the program provides "an easy-to-learn environment that packs much of the power of professional packages." — RI

McGee Whiz

Rebecca Parascandolo's description of our program McGee (September '90, page 115) is reasonably accurate, but it might have been more insightful had she engaged a preschool child for help with her review. McGee is targeted at preschoolers who are using a computer for the first time. Activity selection and overall size of the program (two disks) are limited to allow young children to run the program by themselves without extensive disk swapping or the frustration of clicking on dead screen areas.

Steve Vance
Lawrence Productions
Galesburg, MI

Rebecca Parascandolo did engage two preschool children (Bianca and Ivan Parascandolo) to help evaluate McGee. If you don't believe us, you'll find their respective pictures on page 53 of the July '90 issue and page 208 of the August '90 issue. — RI

The Big Screen

Your October '90 issue was exceptional, but why didn't you mention in "Power Presentations" (page 191) the option of Generation X's (no relation to Billy Idol, I think) new video card/box and a big-screen TV? A 25-inch television along with this new technology would run less than $1,000 — much more cost-effective than LCD projectors. Even with the 50- or 60-inch behemoths, the price is consistent with those of LCD projectors.

Plus you have the benefit of a working television for use with VCR presentations or just for showing football games at the office party. Such an expenditure would be easier to justify than the LCD technology, especially to old-school computerphobe bosses (who do, in fact, still exist).

Jim Downs
Huntington Beach, CA

Go Fish

I was a little disappointed with "33 Unsung Shareware Programs" (October '90, page 244). Games, INITs, and hacker supplies are nice, but I'm sure many Mac users would like to do more with their machines than watch fish swimming across the screen. We'd like to see what sort of educational shareware programs exist that we could use to build an actual

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library, such as a program about fish that would show how to identify certain types.

John Brosnan
Mankato, MN

It's true that shareware authors gravitate more toward the practical and the whimsical than the educational. But (speaking of gravitation), Gravitation Ltd. by Jeff Rommereide surely fits your criterion. If readers know of other outstanding educational shareware, let us know and we'll spread the word. —JB

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Game Preserve

I read with interest John Dvorak's column in the October '90 issue. However, I must take exception to one comment. He wrote about Atari and its "just-plain-mean suit against Nintendo." If I remember correctly, Nintendo first sued Atari, because Atari had found a software way around the lockout chip in the Nintendo system. This allowed Atari to produce cartridges without buying Nintendo's chip. Atari countersued. From Dvorak's tone, it sounds as though he thinks the chip is a good idea. I can imagine his outrage if Apple computers could accept only disks sold by Apple and all the software companies had to buy their disks from Apple. Although the chip has reaped untold profits for Nintendo, the prices for the cartridges are outrageous. Aren't Mac software and hardware expensive enough?

Paul G. Gifford
State College, PA

What Goes On?

As a programmer for close to 20 years, I totally agree with Thom Hogan's comments concerning diagnostics ("The Self-Supporting Mac," October '90, page 263). When I first received my Mac, I was appalled at the number of manuals and the amount of useful information that came with it. I have *Inside Macintosh* and other books and am *still* trying to figure out what's going on inside the box. Now, I realize that I'm much more technically inclined than average users, but I'm tired of calling Apple, at my expense, and having to say things such as, "OK, if *you* don't know it, tell me who *does!*"

Ed Fouse
Euclid, OH

Letter Imperfect

I appreciated your in-depth Buyer's Guide to PostScript printers in the October '90 issue ("The Letter-Perfect PostScript Printer," Buyer's Guide, page 5). Unfortunately, the usefulness of this evaluation is marred by contradictory product scoring presented in the article. The caption that accompanies Figure 1 ("Jury Results," page 16) points out that the NEC Silentwriter2 290 "consistently brought up the rear, with the worst image quality," while the chart places this printer well ahead of most of the other printers in the overall subjective rating of text and graphics quality.

Additionally, this chart shows the

LaserMAX 1000 Personal Typesetter as the clear overall winner in text quality. However, later, in the sidebar "All-in-One: The Desktop Publisher," potential printer buyers who specialize in desktop publishing are warned that the "The LaserMAX 1000 had the best graphics performance, but this was offset by its poor text quality." In fact, the quality of text was so poor that this enhanced-resolution printer actually "scored lower than some 300-dpi printers." For many professional publishers, this concluding statement would immediately remove this otherwise excellent printer from their shopping lists.

Todd Cranston-Cuebas
San Marino, CA

The caption for Figure 1 was in error. The NEC Silentwriter2 290 did not bring up the rear in image quality. It was the NEC Silentwriter LC 890XL that consistently had the worst-looking images.

As for the LaserMAX 1000, if you look on page 54 of the Buyer's Guide, you'll see a reprint of our jury page. You'll notice that we used a serif Times and a sans serif Helvetica as text samples. We asked our jury to rate both of these samples. To make the chart readable, we combined the two jury results into a single bar result. If we had shown the ratings for each text sample, you would have seen that the LaserMAX scored worse than the LaserJet III for the Times sample. Our jurors gave the LaserMAX the highest rating on the Helvetica text, however. But we felt that for a printer with a claimed resolution of 1,000 x 1,000 dpi, such a low ranking on the more complex and demanding serif text was unacceptable. We felt that the Times test quality of the LaserMAX was indeed "poor" compared with that of the other high-resolution printers. — PY

6, No Trump

Bobker's Dozen (October '90, page 48) failed to mention that Artworx's Bridge 6.0 reneges as well as deals the same card to two players. When I wrote to the company about the problems, it advised me to buy the upgrade (I had version 5.0). As version 6.0 *still* has the problems, I feel duped by the company and would not recommend buying anything from it.

David Lazar
Olympia, WA

When we contacted Artworx, the company said the bug that you described has been fixed in a subsequent run of version 6.0. You should return your disk in exchange for a free upgrade. — SB

DIY DPI

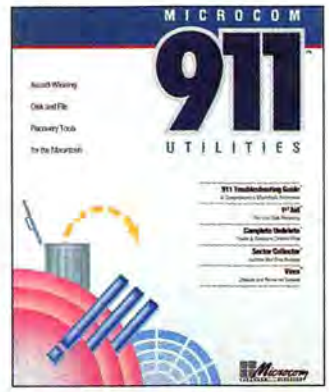
On page 58 of your October '90 Buyer's Guide ("Do-It-Yourself Printer Testing"), you present an interesting set of graphics for testing PostScript printers. Everything looks great with the exception of the scanned photograph. On page 54, you note that the photo was a

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Please circle 123 on reader service card.

200-dpi scan. If the image was reproduced at the original size of the scan, the "blockiness" seen here should not have occurred.

Lawrence J. Grinnell
Palm Springs, FL

The image problem you caught was a mistake. We actually produced the scan of the binoculars from an 8-x-10-inch glossy at 100 dpi, reduced it by 50 percent to make a 200-dpi image, and saved it in TIFF. The image was then placed in a PageMaker 3.02 document. The problem developed when the PageMaker document went to our service bureau for output, where it was imaged at 2,540 dpi on a Linotronic L300. Unfortunately, through the wonders of linked documents, the scan imaged a 72-dpi PICT representation of the 200-dpi TIFF image that PageMaker shows on the screen. PageMaker lost the link information from the scan, and the results were not detected until too late. Rest assured, though, that when we juried the images from the PostScript printers, the 200-dpi scan always imaged correctly. — PF

Where's Bruce?

As we all know, many commercial programs are available for the Mac that cost too much, come with unintelligible documentation, and may or may not run at all on newer machines. But with Bruce Tomlin's wonderful shareware program SoundMaster, I have seen adults laugh when the Mac went "blaaah!" while ejecting a disk and children squeal with delight at the sound of the wicked witch cackling, "I'll get you my little pretty!" All this for $15.

I'd like to send Mr. Tomlin his shareware fee. I sent a postcard to the address that was listed in your magazine to be sure he was still there, but I have not received a reply. Please do everyone a service by locating and printing his current address.

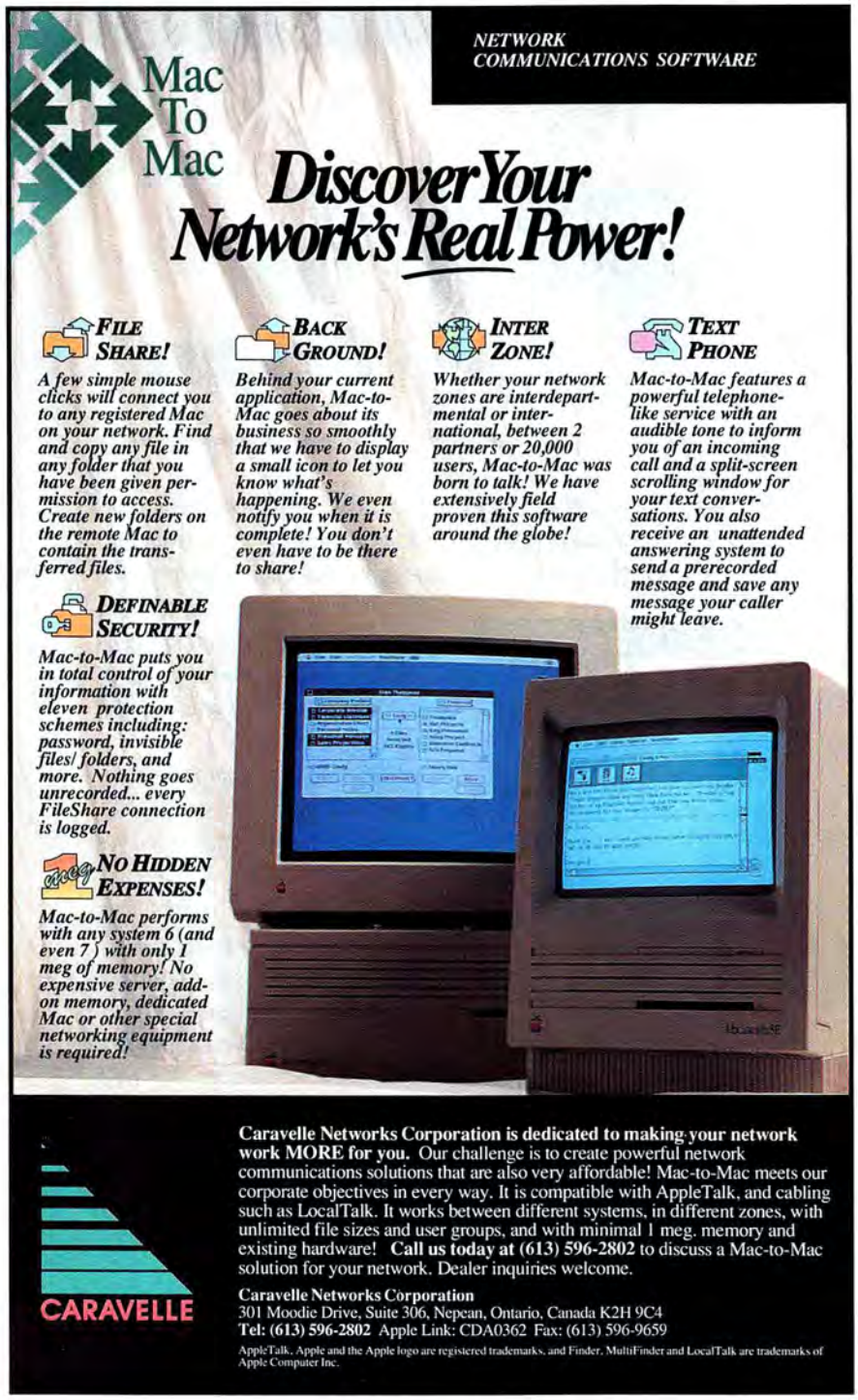
Keith Johnson
Malmstrom AFB, MT

Mr. Tomlin's address hasn't changed; send $15 (not a postcard) to 15801 Chase Hill Blvd., #109, San Antonio, TX 78256. — MS

Clarifications

In the "The Right Tools for the Write Job" (September '90, page 241), the phone number for Screenplay Systems is incorrect. The correct number is (818) 843-6557. The price for Scriptor 1.5 is $295, not $299.

The review of Accountant, Inc. Professional (August '90, page 75) listed the wrong price and address. Version 1.03 is available for $595 from Softsync/BLOCPublishing, 800 S.W. 37th Avenue, Suite 765, Coral Gables, FL 33134; (800) 933-2537.



Please circle 420 on reader service card.

In a world that changes economic systems overnight, can we really afford personal computer systems that take weeks to set up, months to learn, and years to deliver on their promises?

No. But, fortunately, afford a

In the 1980s, American companies invested nearly $90 billion in PCs, yet office productivity has shown disappointing gains.

Not everybody was disappointed, however. According to a new independent study by Diagnostic Research, Inc.*, companies that invested in Macintosh® computers are enjoying dramatic results. Managers gave Macintosh productivity ratings that were 37% higher than for MS-DOS systems and 32% higher than for PCs running Windows. Which is like getting back 17 extra weeks a year.

In a global economy of snowballing competition, the story behind those figures may be of interest.

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The new Macintosh Classic, Macintosh IIsi, and

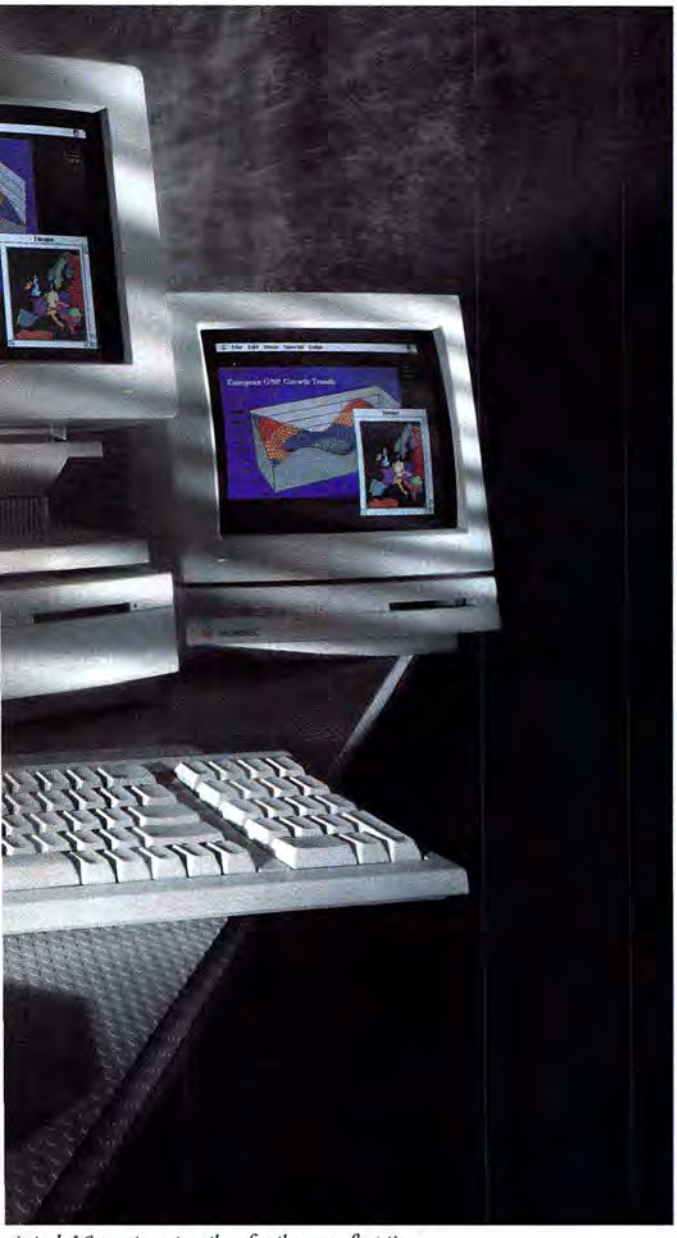
The Macintosh LC.

The new, low-cost Macintosh LC introduces exquisite

** The figures are included in a 1990 study conducted by Diagnostic Research, Inc., among Fortune 1000 managers and business computer users familiar with Macintosh and MS-DOS or Windows systems. Call and we'll send you*

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Would you pay $4,995 for a spreadsheet program? Here's one that just might be worth it. And here's a 25-cent investment that could make it a lot cheaper.

If you haven't read our cover story on the three new Macintoshes yet, stop wasting your time here and turn to it immediately. You won't be disappointed. (But please come back. Don't worry, I'll wait.)

(Uhm-hmm . . . the Macintosh Classic . . . How 'bout that Mac LC . . . the IIsi . . . sound! pretty neat . . . Apple IIe emulation — about time . . . OK . . . you should . . . be done . . . just . . . about . . . *now*.)

Now that you've had a peek at three of the most long-awaited, most overanalyzed, and most innovative hardware releases of the year, your mind may be drifting to thoughts of *software*. What good's a new CPU without something way cool to show it off with? System 7.0 — whose development has, at various times, been neck and neck with Windows 3.0, HyperCard 2.0, the new CPUs, and the unraveling of who killed Laura Palmer — has been beaten by all four (or at least three of them, depending on whom you believe) and now has a firm ETA of sometime in the first half of 1991 (read: next June 30).

So now that you've had a look at some of the hottest hardware of 1991, where can you go for a twin peek at 1991's software hit parade?

Here's a glimpse of the next big idea in software. And it definitely came from an unusual source. A microcassette tape arrived in the mail recently in an envelope with no return address. The name and address were smudged, and I don't think it was intended for me. I played the tape, and this is what it said:

"Diane, this is Federal Agent Cooper. Now that the Palmer case is all wrapped up (in plastic! Just a little joke, Diane), I've headed down to Silicon Valley to search for the Most Wanted duo in this community — a real killer and a drop-dead radical. These two have paralyzed the hearts and minds of this sleepy little computer hardware and software haven.

"I've checked into the Sunnyvale Suites motel. Spectacular aerial views of Cupertino at the hotel's OverByte cafe. No coffee, no pie, but they do serve up a damn fine glass of Jolt cola. The Twinkies in the minibar are a nice touch. I suspect I may have been a software developer in a former — or future — life.

"The local authorities have been less than cooperative and haven't told me exactly who these two are that I'm looking for, but from reading the local computer magazines, I've formulated these profiles.

"First, everybody's on the lookout for a gentleman who goes by the alias of Killer App. That's 'App' as in application, Diane. They call him Killer because he's the App that people would kill for; that people would contemplate switching platforms for; that people would actually consider shelling out bucks for, instead of just pirating software. He's also called Killer because when he legitimizes a new platform, he threatens to kill off an existing one.

"His buddy goes by the handle of Drop-Dead Feature. This is one scary hombre, Diane. He's the guy who makes happy end users abandon their application of choice for a newcomer. Computer companies in these parts live and die thanks to Killer App, and software companies live and die on the awesome power of Drop-Dead Feature.

"Last night I had a dream, Diane. I dreamt I was listening to radio station KMAC and that the DJ started off the set with The Silhouettes' classic 'Get a Job,' which he played twice, and followed it with a cut from The Who's *Who's Next* and ended up with Duke Ellington's 'Lotus Blossom.'

"'Job' twice? Plural: Jobs. That's Steve Jobs, Diane. Next? Lotus? The pieces all fit. The next killer app — full of drop-dead features — is on the NeXT machine, and the name of that app is — "

At that point, the cassette ran out of tape, so we may never know whether Federal Agent Cooper was on the right track, but I've got a few theories of my own.

Consider Agent Cooper's radio-induced dream. Finding new and fresh software is a bit like finding new and fresh music on the radio. Among savvy DJs, looking to offer something besides the same old variations on a theme to Top 40, the buzzword these days is *world music*. From lambada to Ladysmith, from carioca to karaoke, from the Boss to bossa nova, world music — a chauvinistic shorthand for non-U.S. music — is where the action is today. And on computers, "world software" — that is, the non-Macintosh arenas — is where some of the real challenges to Apple are coming from.

Killer apps are the Holy Grail of the computer community. Every other press release trumpets the arrival of a killer app, a piece of software so original that it defies categorization and will revolutionize not merely the computer industry but also the way America does business.

Usually these overzealous announcements come from overzealous startup companies. The big guys know not to overdo the hype. They know that a true killer app comes along only once every two or three years. HyperCard was one. PageMaker was one. And Excel, offering relief from the character-based Lotus 1-2-3 world of spreadsheets, was another.

And now, the newest killer app: It's called Improv, and it has not one but several drop-dead features. They are so radical that they're difficult to describe in print — although their operation is extremely clear and intuitive when you see Improv in action.

So what *is* Improv? It's a spreadsheet program — sort of. Who's it from? Would you believe . . . Lotus? What kind of hardware does it require? That's the catch: It runs only on the NeXT — so far.

If you're ready for the next generation of spreadsheet programs, it's going to cost you — somewhere between 25 cents and $4,995 — but more on pricing later. What are you going to get that will make it worth switching software — and maybe even worth switching computers?

Spreadsheet programs are simple and intuitive, as long as your work sheets stay manageable — say, 50 rows by 50 columns. Much beyond that — when you can no longer see your entire spreadsheet on a screen or two or when the underlying relationships among cells are buried deep in invisible formulas — the spreadsheet metaphor gets a bit strained. When you add new rows and columns, it's all too easy to mess up a formula. You eventually take the plunge and learn to write macros to automate time-consuming chores such as rearranging your data. And because spreadsheet programs don't have debuggers to verify that the logic of your data model stays intact, as your spreadsheet model grows, you're left with nagging doubts about the validity of the numbers generated automatically by the spreadsheet program.

All this comes as a result of trying to force a spreadsheet program to do the work of a database program. The solutions are either to switch gears and shift to a relational-database program or to thoroughly document your spreadsheets and rigorously follow a planned and proper protocol for modifying them. But both alternatives are contrary to the main reason many of us embraced spreadsheet programs in the first place: the ability to quickly and easily organize information and try out a variety of what-if? scenarios with your data.

What Improv does is let you play what-if? games with the structure of your *spreadsheets*, not just the data. When you set up a work sheet, data is assigned to various categories. The meaning of the data and the relationships among categories are defined in a separate formula pane rather than hiding behind each cell. The benefit of this approach becomes clear when you want to, for example,

OS/2®, MS-DOS®, 2 PC/AT® Slots, VGA, PC/Novell® EtherNet for Your Macintosh®

Orange® 386 OS/2, MS-DOS® Coprocessor

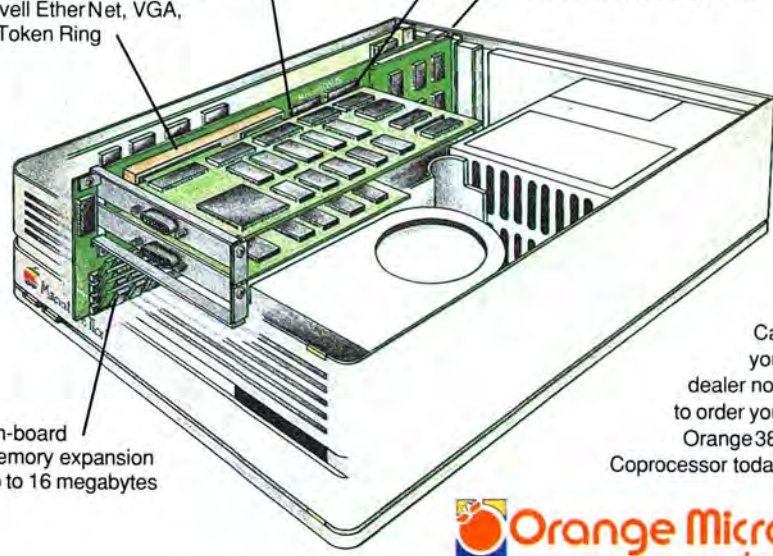
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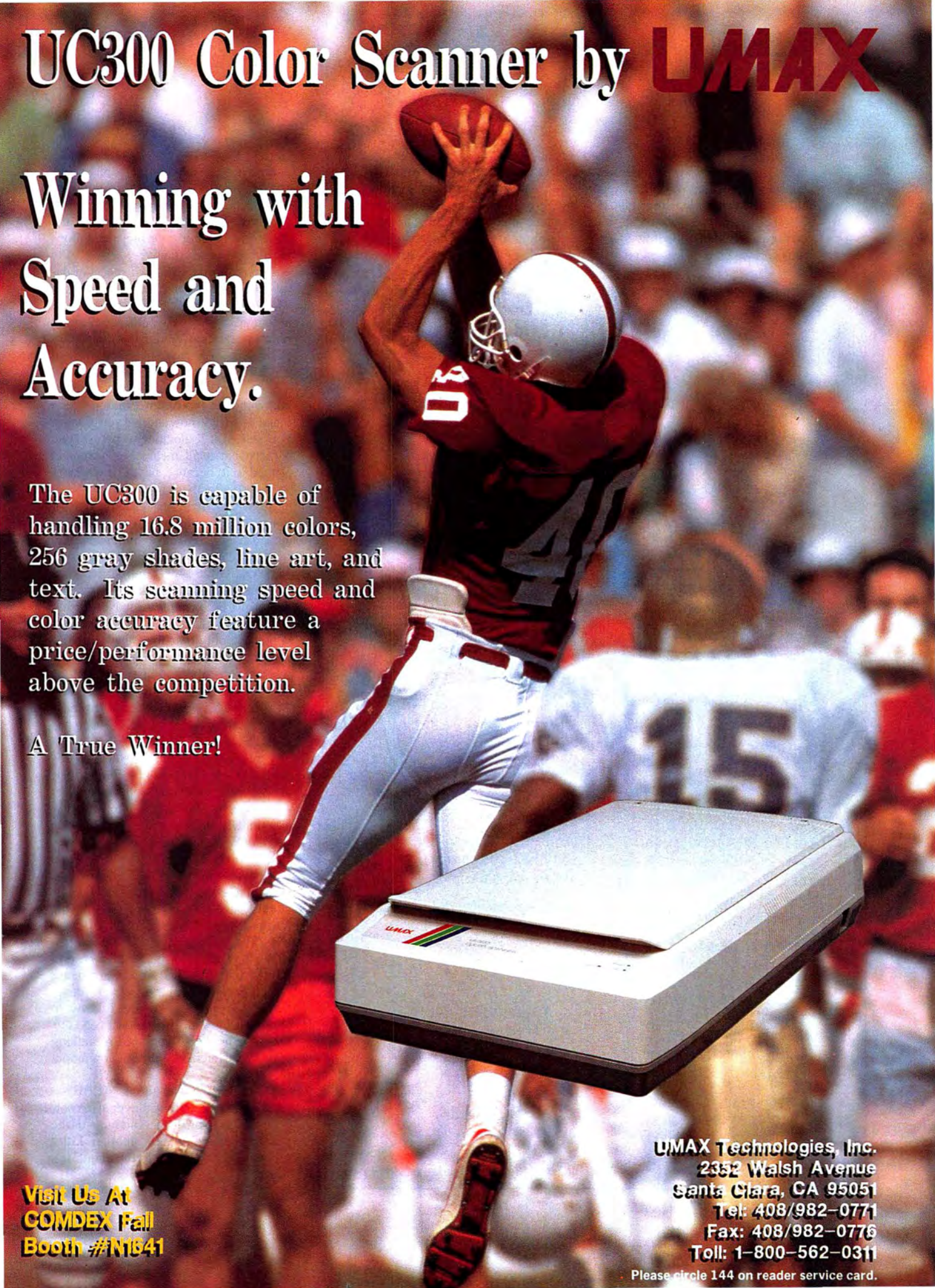
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change your spreadsheet view from, say, unit sales divided into product categories and sales territory on the vertical and sales periods on the horizontal, to sales territories divided into unit sales and sales periods on the vertical and product categories on the horizontal.

With a spreadsheet, just thinking this through is a formidable challenge. And rearranging the cells, retaining every formula, maintaining every link, and assuring the integrity of every piece of data is always an absolute nightmare.

With Improv you just shuffle the category labels and the spreadsheet is instantly rearranged, letting you see the fruits of your labor — be they revelations or gibberish — instantly.

Improv brings two key aspects of database design into the realm of the spreadsheet. First, it brings the ability to automate this kind of reconfiguration and report generation. And it gets this ability because it also borrows the discipline that a database structure imposes on users. You can't simply blindly enter numbers and formulas (you know, the ones that make sense right now and that you promise yourself you'll document before you forget what it all means but never get around to it, because, hey, if it works, it works, so why mess with it?).

So what's it gonna cost to see for yourself and step into the future of spreadsheets? As I said, somewhere between 25 cents and just under five grand.

If you like the $4,995 option, get down to your local BusinessLand, ask for a demo of Lotus' Improv for NeXT, and whip out your checkbook. The bad news is that the only machines that currently run Improv are the NeXT family of workstations; the good news is that (a) NeXT recently introduced a low-end $4,995 machine and (b) the software is being bundled free with NeXT machines until December 31, 1990.

If that's too pricey, consider the 25-cent solution: Get out a piece of paper, and write the following words on it: "I'm a Mac user who's ready — intellectually, emotionally, and fiscally — to decide whether Lotus will blossom in my future. Please port Improv to the Mac." Mail that piece of paper (that's the 25-cent part) to Donald Casey, VP, Spreadsheet Division, Lotus Development Corp., One Rogers Street, Cambridge, MA 02142. (Or send your comments to me electronically on Zmac in the MacUser forum [GO MACUSER], and I'll forward them.)

Let the Lotus people hear from you — before they decide to port Improv to Windows instead. If you don't need this kind of power or if you need something entirely different, let them know about that too.

Diane, I'll muse about MUSE — another up-and-coming player in the not-necessarily-a-spreadsheet arena — on the next tape. And there's another killer product you'll need to know about. It's called —



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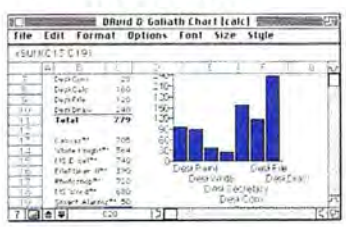
1. DeskWrite: This word processor comes with a spelling checker, find and replace, tabs, headers, footers, preview, envelopes, mail merge, text wrap around graphics, borders, and lots more.

2. DeskSecretary: A window pops-up on screen to remind you about important appointments, tasks, birthdays, etc. Set recurring intervals, early warnings, and even discreet messages.

3. DeskCom: The communication program lets you send and receive files, even when using other applications (with or without MultiFinder). Supports XModem protocol and Hayes® and Apple® compatible modems.

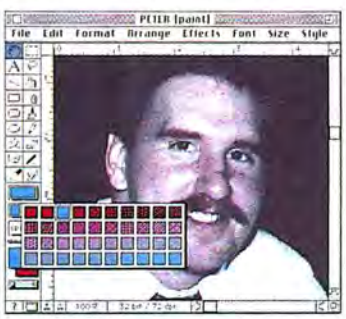


4. DeskFile: The database allows the entry of text, numeric, and graphic fields. Super-fast searches and sorts. Customize forms, labels, and lists. Import/export files from/to databases like Filemaker™ and 4th Dimension™.



5. DeskCalc: A spreadsheet with charting. Full cell formatting including colors, borders, font, size, and style.

Worksheet size to 256 columns by 2,047 rows. Over 50 functions and 8 chart types (pie, bar, line, etc). SYLK file compatible (works with Excel™, Works, etc.)



6. DeskPaint®: A universal black and white, gray scale, and color paint program (8 or 24 bit). Editing features include autotrace, free rotate, cropping, custom color palettes, distortion and smoothing tools, and gradient fills. Image control lets you change brightness, contrast, and sharpness.

Save and load TIFF, MacPaint®, and PICT formats. Works great with all scanned images.

NO BULL SHEET!



DAvid vs. Goliath

They laughed at brave little David when he set out to battle the big, fat, muscle-bound Goliath. How could he win? Modern day people think desk accessories are wimpy and applications are big. Boy do I have a surprise for them!

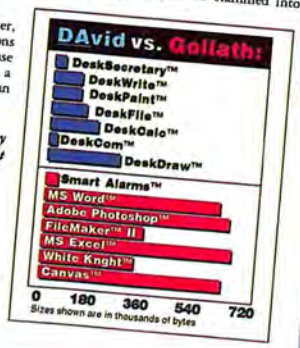
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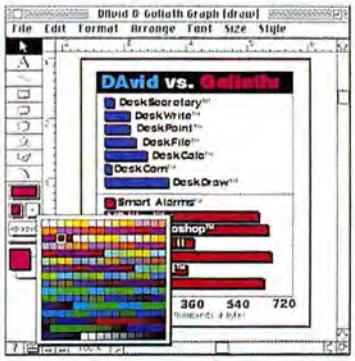
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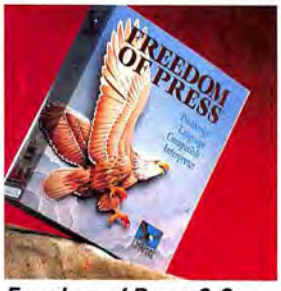
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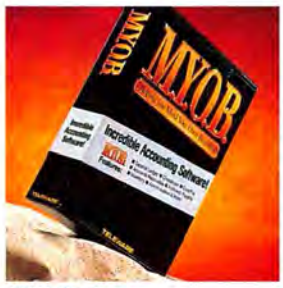
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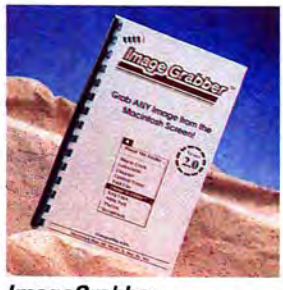
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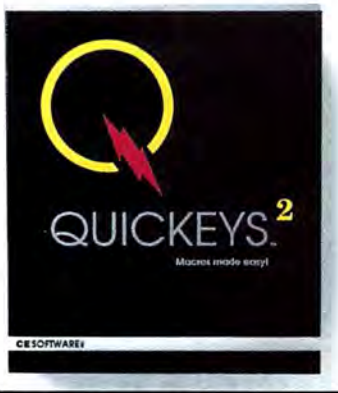
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ROBERT WIGGINS

A Tale of Two Fads



Outline processing came and went — maybe it should have stayed. But handwriting recognition hasn't arrived yet — and maybe it shouldn't.

You've probably been reading and hearing about handwriting recognition, which is being called the next breakthrough in computer technology. There hasn't been much concrete information about it, but hints about something amazing keep popping up.

Lots of dollars and big-name pioneers are showing up behind startup companies such as Slate and GO. These startups have been getting a lot of attention, even from the business press. There are still no real products, mind you, just the promise of another revolution to bring computing power to the rest of us. The concept has a lot of people pretty excited — even Apple is allegedly looking into it.

Stop and think about this for a minute. The hype is promoting the idea of a computer that reads your handwriting (or, more precisely, your printing, because cursive can be hard for people — much less computers — to read). Never mind that today's computers have trouble reading typefaces, where every character is identical each time it appears. Even the best recognition hardware and software working at 300-dpi can't achieve 100-percent accuracy. So, assuming that the startups do have some big breakthrough waiting in the wings, here's the main question: Is printing on a touch-sensitive pad really going to be that much better than using a keyboard?

The first argument for the technology is that it will open up computers to nontypists. This may be so, but a person of average intelligence can become fairly proficient at hunt-and-peck typing, with some practice. Most people can type much, much faster than they can print (especially if they have to print carefully). So what about people, such as executives, who *won't* type? Do you really believe that executives who feel that using a keyboard is beneath them will think that precise hand-printing is more their style? They're more likely to put the handwriting computer on their secretary's desk alongside the traditional one with the keyboard.

Some companies working with this technology have realized that keyboards are really the most appropriate data-entry mechanism for desktop computers. But what about portable computers? A handwriting-recognition slate could be much smaller than a standard keyboard. As keyboards shrink, typing speed decreases, which might make handwriting (even printing) faster after all. The dream is to create a fully functional computer about the size of a Sharp Wizard or Poqet PC but without the drawbacks of a tiny keyboard. Perhaps even Mac-like capabilities are possible with the use of a stylus to point and drag icons or select from menus. (Sony already markets such a device in Japan.)

There are some other scenarios for this technology. Electronic notepads that recognize handwriting could be useful for applications that don't require much writing and also in environments that are rough on conventional keyboards.

There is one surefire application: Japanese and Chinese word processing. For the thousands of unique ideograms in the written form, handwriting recognition could be a revolutionary leap beyond today's painfully clunky word-processing methods.

So does handwriting recognition have a future? Maybe, if the recognition rate can be close to 100 percent and if a way can be found to exploit the technology in new ways. In any event, keyboards aren't going to disappear, and typing ability should remain a prerequisite for using computers.

Handwriting-recognition technology may turn out to be a big flop. On the other hand, if you'd come to me in 1980 and described a system with a mouse for pointing at little pictures on-screen, I'd probably have held out little hope for it either.

Outlining and More

While handwriting recognition inches toward fad status, I see far more potential for a faded fad: outlining. Last summer, Symantec released MORE 3.0, a major revision of a popular program. If you believed most of MORE 3.0's press coverage, you might think all it could do was desktop presentations.

Admittedly, MORE does great presentations, and its new Chart Tutor feature makes creating presentations a snap even for first-time users. But it also has another life as an outliner and even possesses some word-processing capabilities. This descendant of ThinkTank, the original "idea processor" (read: outliner) for the Mac, is being compared only to Aldus Persuasion and Microsoft PowerPoint. Why is this? Is the Mac community so addicted to trendiness that only the latest product categories are worthy of consideration? Or is outlining just passé?

Maybe the Mac attracts visually oriented people who think text-based outlining is too structured. Or perhaps the multidimensionality

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of products such as HyperCard makes two-dimensional outlines too mundane. Outlining isn't hot, or sexy, or new. In fact, you probably already have an outliner and may not even know it. Several word processors, such as Word, FullWrite, and MindWrite, include outlining facilities. Even one of MORE's competitors in the desktop-presentation field, Persuasion, has a rudimentary outliner. And Acta, the popular DA outliner, also has an application version (and even came bundled with MORE at one time). So if you want to try your hand at outlining, you may already have the necessary tool.

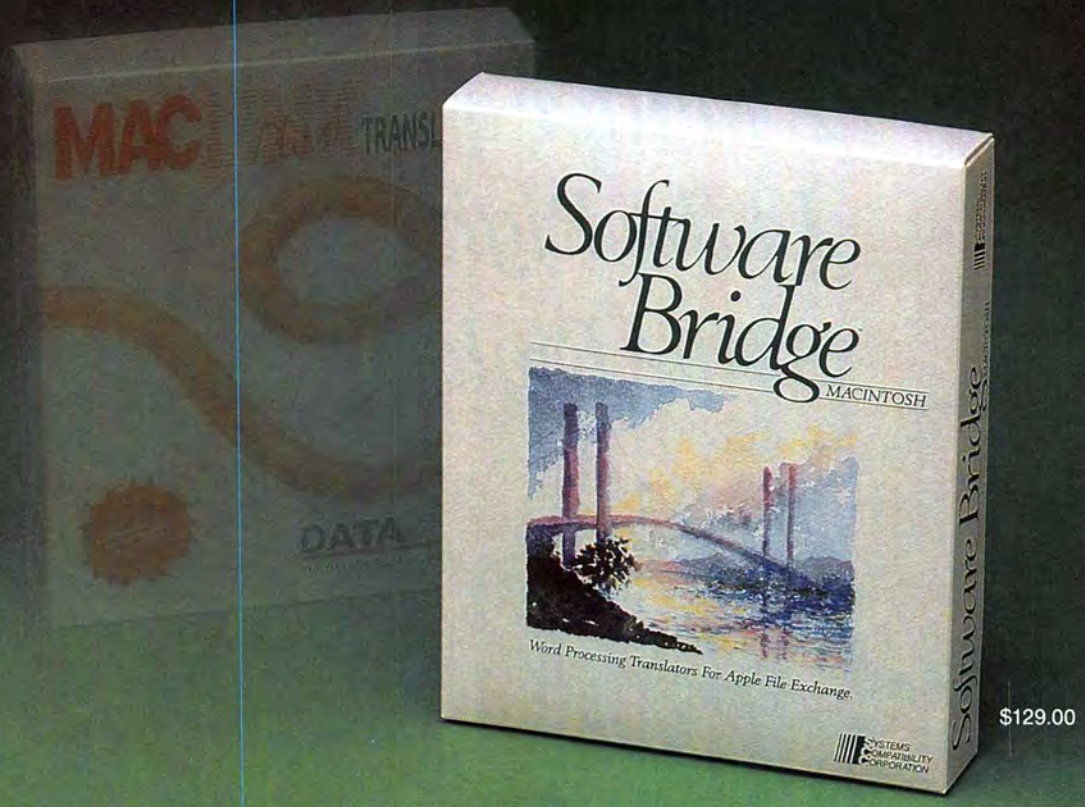
Outlining may bring back memories of high school and hard-to-remember numbering schemes or rules such as never having just one subordinate item. But the reason you had to learn outlining in the first place is that it really helps organize your thoughts. If you try it on the Mac with almost any of the available programs, you'll find that it's also an excellent way to reorganize your thoughts with a simple point, click, and drag. It's like having each outline item on an invisible movable file card. You don't even have to remember any complicated numbering schemes, as most programs handle the labeling (and relabeling when you move things), often with a choice of styles.

Once you've organized (and reorganized) your thoughts, almost any program that offers outlining can let you take it a step or two further. MORE can create tree or bullet charts from outlines. MORE even gives you some word-processing capabilities, at the memo or simple-report level, but Word and FullWrite let you hang an entire book on the skeleton of your outline. All three offer rules and styles for the various outline levels, so you can customize your output.

If you have never tried outlining to organize your thoughts, pick up one of these products and give it a try. You may be amazed at how far outlining has come since you were in high school. And if you've tried outlining on your Mac and hated it, perhaps it was because of the program. Some people hate the outliner in Word, and others love it. Almost everyone seems to like Acta and MORE, although some have strong feelings one way or the other. Try a different outliner, and see if it helps.

And someday, if technology advances, you may be able to enter your outlines in handwriting, going full circle from pencil and paper to stylus and slate.

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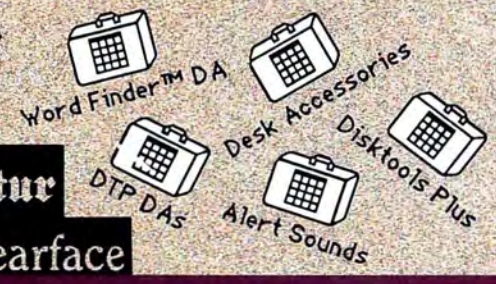
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GUY KAWASAKI

Stand by Your Man(agers)



How can Apple bring the Dream back to life? Start with a stable management team — and then stick with it.

Macintosh is successful now. Just about anywhere you go around the world, people either use a Mac or have heard about it. There are thousands of Mac user groups. Steve Jobs' prediction that Mac would become the "third standard in personal computers" has come true.

It's a stinking shame that at the brink of a grand-slam success, Apple seems capable of hitting only singles and doubles. Truly, Mac and the IBM PC/clones should reverse market shares if Apple did it right. Apple has dumped the come-to-Macintosh fervor and zeal of 1984 – 1985 and replaced it with the sugar-coated veneer of professional management.

This column is about how Apple can restore the old kind of evangelical fervor and zeal. If Apple can rekindle its flame, I can't guarantee better products, faster revisions, and inspired marketing, but these things would become more probable. And we would feel better, even if Apple failed from time to time.

The Way Things Were

Before continuing my sermon, let me state that in this case, hindsight is not only perfect but it's also rose-colored. As I recall,the mid-1980s were pretty miserable days for Apple. Macintosh wasn't selling well. There was very little software. Apple exorcised Steve Jobs and laid off several-hundred employees. Still, looking back, those were fun times.

Developers were creating Macintosh products, despite what their spreadsheets showed. People who bought Macs were laughed at or scorned — and loved it. We were sure that Macintosh was going to change the world. Our perspective was "Lead, follow, or get out of the way." The frightening thought of failing made it more exciting: Apple could die.

The Way Things Are

Today, in what should be the halcyon days of Macintosh, evangelism inside Apple is dead. Ironically, the very success that evangelism created, killed it. In 1984 we knew we had to use evangelism to survive. It was obvious that user groups, developers, and Mac fanatics were the means to success. Now that Apple is successful, it thinks it did it alone.

To some extent, deterioration of evangelism is inevitable as Apple grows larger and older and the slime of a new bureaucracy covers the flame of the original vision. But it is also only as inevitable as we let it be. If Apple were any other company, it would be OK to say, "It's bigger now. Things change. That's life," and let it go at that.

But Apple is not just another company. It's Apple, and as Apple, it represents dreams and ideals that should invent the future and forever change the rules of computing and business. That's why Apple has to be fixed.

Stabilize Top Management

Allow me, then, to propose a few ways to fix this situation and rekindle the flame of evangelism inside Apple.

The greatest deterrent to evangelism at Apple is the instability of its management. Apple's executives turn over more frequently than Sony Walkmans at 47th Street Photo. Each time a new executive comes in, he eighty-sixes the existing staff, brings in a new one, and becomes a golden boy for about six months until he gets wasted himself.

During this process, budgets are frozen, responsibilities are uncertain, and employees are demoralized. It's very hard to feel zealous when you don't know who your boss is and how long he or she will last.

It is not acceptable to hire people, see if they work out, and then fire them if they don't. The highest levels of Apple should stop getting away with the logic of "Don't blame us. It's the bozos we hired." If they hire bozos, they are bigger bozos. Building a stable management team is their responsibility. If they can't do it, they should go.

Promote from Within

There are two ways to fill the management positions at Apple. One is to hire experienced bozos who have supposedly done it before in the personal-computer industry, the broader computer industry, or some consumer-goods industry Apple admires — such as personal-hygiene products, for example. The other is to promote people from within. I favor the latter.

I base this preference on watching the constant flow of newly recruited saviors who go into and out of Apple like the tide, floating like Styrofoam cups on the surface of the water, waiting to choke some unsuspecting marine mammal. Instead, Apple should tap into its middle-management layer.

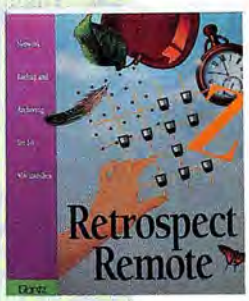
Although this would be a stretch for many current employees, these people offer several desirable qualities. They've seen it all: the decline of the Apple II, two failed "Test Drive a Macintosh" promotions, and controversial engineering projects such as fax modems.

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They know and love Apple's technology. They certainly hate to reorganize. And frankly, they're also less expensive.

Leave the Engineers Alone

Apple's top management needs to leave the engineers alone. I'll let you in on a secret. At great engineering companies, management leaves the engineers alone. At good engineering companies, management interferes but engineers ignore them. At lousy engineering companies, management thinks it is the engineers.

Apple runs engineering on a last-in, first-out (LIFO) basis. This means that whatever management last read about in *Popular Science*, heard from an analyst, or saw in a competitor's ad becomes the most important project. (LIFO is an accounting convention, not an engineering path.) At first engineers go crazy when this happens. Then they shut their brains. Then they leave. My recommendation is to leave the engineers alone and let them get back to creating great products.

Decentralize Decision Making

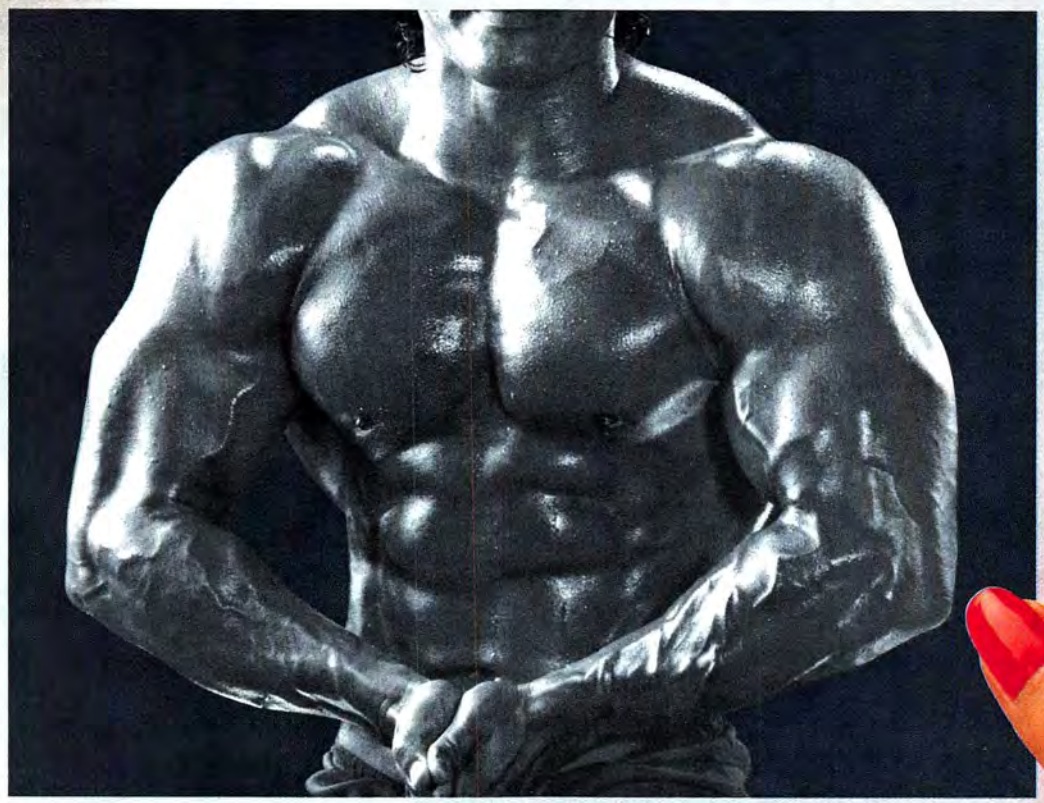
Not only is Apple's Cupertino management unstable but it is also too powerful. Thus, we have the worst of both worlds: Management in Cupertino is incapable of making the right decisions, and the people in the field who are capable of making the decisions are not empowered to do so. (Rule of thumb: The farther an Apple employee works from Cupertino, the more effective he is. This is known as the Spindler Effect.)

My recommendation is to push much of the sales and marketing decision making out to the regional offices. Let the people who are closest to the customers make most of the decisions. Things won't be as coordinated and they will waste some money, but it's being wasted anyway — on the $30 million Helocar campaign, for example; $30 million could buy a lot of sales seminars, loaner units, donated equipment to schools, and developer comarketing projects, all spearheaded by Macintosh evangelists in the field.

Conclusion

The flame of evangelism may be flickering at Apple, but it's not out. (I doubt that it could ever completely go out.) The bases are already loaded, and these are some ways to fan the flame so that Apple can hit one out of the park. It can be done. It must be done. You see, it's Apple's destiny.

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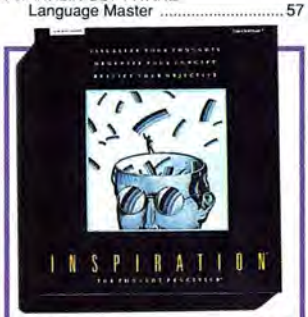
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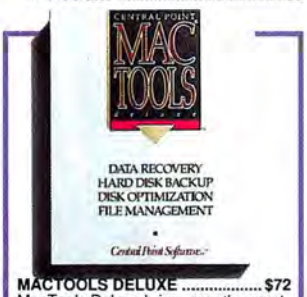
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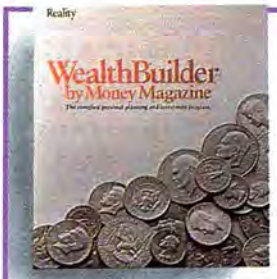
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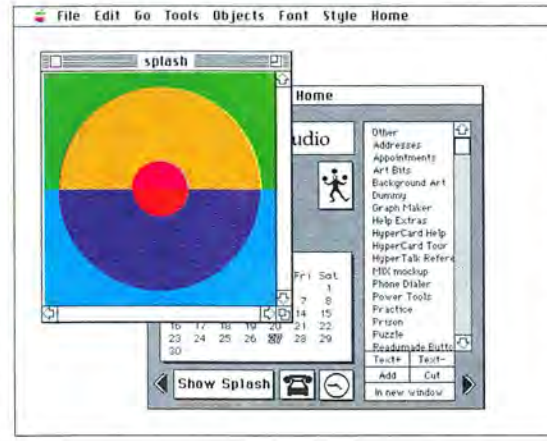
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HyperCard

HyperCard 2.0's much-delayed upgrade is worth the wait.



Although HyperCard 2.0 can't create color graphics, it can display color images of up to 24 bits in an external window. HyperCard is still limited to bit maps, and you can't directly associate scripts with graphics, but most of the other limitations of previous versions have been removed.

The latest version of HyperCard comes in three forms: the minimal, bundled form that's included with all Macs; the upgrade, which includes the minimal version plus three manuals and dozens of sample stacks; and Claris' soon-to-be-released standalone package that includes everything in the upgrade and some extra goodies. This review is based on the upgrade.

The HyperCard timing was ironic: At just about the time NeXT was announcing its first color computer, Apple released version 2.0 of HyperCard, still in black-and-white. True, it's possible to display beautiful 32-bit color pictures with 2.0, but only in external windows. Graphics, in general, are not the strength of the 2.0 upgrade: HyperCard is still limited to bit maps, and you still can't directly associate a script with a graphic.

With those exceptions, most of the complaints about the old HyperCard have been addressed in the new version. Gone is the fixed-size HyperCard window; gone is the inability to have more than one stack open at a time. Text formatting and printing, two very weak points of HyperCard 1.x, are significantly improved, and hypertext linking from text fields is now adequately supported. There are three manuals now, including introductions to HyperCard and HyperTalk, and a general reference. Although there is no advanced scripting manual, there is good on-line support for learning HyperTalk. Overall performance is improved, and stacks can now run in the background under MultiFinder.

Stacks developed with HyperCard 2.0 look and act more like real applications, largely because more of the interface is now under the author's control. HyperCard now supports multiple, resizable windows. Cards can be larger than their windows, in which case they can be scrolled (all cards of a stack must be the same size, however). There are an icon editor and a tool for creating your own floating palette windows. There is also almost complete user control over the menus. You can create new menus and menu items, remove existing ones, change the fonts and styles of items, add check marks, and disable items.

Hyping the Text. Text handling has been improved on several levels. Now (at a small cost in performance) it's possible to have multiple fonts, sizes, and styles of text in one field. What's still missing is the ability to change alignment from line to line, and there is no full justification, only right, left, and center justification.

The lack of hypertext support in previous versions was the most amazing HyperCard shortcoming and the first that beginning HyperTalk scripters tried to fix. What was needed was the ability to designate a word or block of text in a field as "hot" and to associate some action with the act of clicking on that "hot" text. For performance and compatibility reasons, it was something that HyperTalk scripters couldn't do; it had to be built in to the product. Version 2.0 implements this capability via several new HyperTalk functions, allowing words or lines or arbitrary groupings of text to be hot. It's possible to trigger off the location of the hot text, its content (the text itself), or even its font attributes (or a combination: italicized words might invoke links to their definitions, and boldfaced words might trigger links to related topics).

Printing was notoriously neglected in HyperCard and is still being treated as something of a stepchild: A full report-generation application has been squeezed into three dialog boxes. But it's a clever stepchild. Although using the report generator takes a little study, it is very powerful. (The manual only skims over the surface of report printing.)

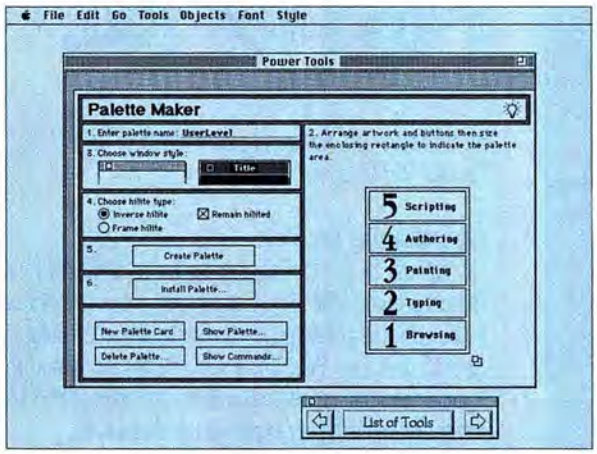
One broadly useful new feature is the ability to "mark" cards according to various criteria. Both printing and searching can be limited to marked cards. Searching has been improved in other ways, including the ability to exclude specified fields, which speeds up the process. You can sort the cards of a stack or the parts of any container.

Although graphics didn't get as much attention as some other areas in the upgrade, there are some nice additions. Graphic images can now be freely rotated and distorted in several ways. You can import and export graphic images via a menu command. There are some new visual effects, and the effects now work properly when color is turned on. And there are new stacks of background art, art clips, and dynamic art effects.

Programming Power. HyperTalk scripters should breathe a sigh of relief over the new script editor. They should also appreciate the source-level debugger and the compiler that replaces the HyperTalk interpreter. Code is now compiled to RAM and discarded when you leave HyperCard; this speeds execution overall, although the first invocation of a handler is slower. The editor is nonmodal, lets you have several windows open at once, and allows you to control the font. The debugger, which

Get Info

HyperCard
★★★★½
Published by: Claris, 5201 Patrick Henry Drive, Santa Clara, CA 95052; (408) 987-7000.
Version: 2.0.
List Price: Not set at press time.



HyperCard 2.0's stacks now look more like applications, including multiple resizable windows. HyperCard also includes Palette Maker, a stack for creating floating palette windows.

supports free-floating windows that track messages and values of variables, is integrated with the editor; both are implemented as XCMDs. Substituting a third-party editor and debugger is as easy as changing the value of a global variable — you must change both though, because they're integrated. The HyperTalk language has been extended to support all the new features, and it's now possible to add stacks to the message-passing hierarchy so that their scripts and resources will become available as shared code libraries.

Potentially the most important new development is the new XCMD interface, which should lead to more-powerful XCMDs and XFCNs and hence to more powerful HyperCard stacks. XCMDs now work more effectively with the event loop. An XCMD can control one or more external windows, and HyperCard catches certain window events and passes them to the XCMD controlling the window. Properties of such external windows can be examined, and sometimes modified, from HyperCard. And XCMDs can run in the background.

The Bottom Line. With the exception of the lack of support for color and object graphics, HyperCard 2.0 is a huge improvement over earlier versions. One can only hope that Claris will address these deficiencies in the next release and that we won't have to wait three and a half years for it.

— Michael Swaine

ToolBook

ToolBook is the Microsoft Windows 3.0 equivalent of HyperCard. Although it works very much like HyperCard, there are some important distinctions.

The most obvious differences between ToolBook and HyperCard 2.0 are in their color and graphics capabilities. ToolBook supports object graphics but not bit maps — just the opposite of HyperCard.

As with HyperCard, you can piece together applications from prebuilt parts or you can get full control by writing your own scripts. ToolBook has two user levels compared with HyperCard's five, resulting in a steeper jump from merely using prebuilt applications to actually creating your own. One help in learning scripting is a script recorder, which allows you to perform actions and then examine the automatically recorded script for these actions. There are many good example books, including samples of color design, and the documentation is good.

For anyone familiar with HyperTalk, though, learning to write scripts in ToolBook's language, OpenScript, is harder than learning the scripting language in SuperCard or Plus. The problem is not that OpenScript differs from HyperTalk in any fundamental way — just the opposite. OpenScript is essentially HyperTalk with some of the syntax and many of the words arbitrarily and annoyingly changed.

There are many small (and not-so-small) differences between ToolBook and HyperCard, but the programs are enough alike that it is possible to convert HyperCard stacks to ToolBook format fairly quickly. [*We'll have a review of ConvertIt!, the ToolBook-to-HyperCard conversion utility, in an upcoming issue. — Ed.*] One implication of this is that the zillion existing HyperCard stacks potentially have a new audience.

Asymetrix, 110 110th Avenue N.E., Suite 717, Bellevue, WA 98004; (206) 462-0501. Version 1.0. $395; run-time version bundled with Windows 3.0.

NewsLine

Reports and Analysis

System 7.0 Delayed Again

CUPERTINO, CA — Apple Computer had some good news and some bad news on the System 7.0 front. Apple announced that it would begin beta shipments of System 7.0 to developers in October 1990 but went on to say that the final product would not ship to users until "the first half of calendar 1991." Although the beta release suggests that Apple has frozen the System 7.0 feature set, the delay will postpone third-party development projects that had originally been scheduled for a 1991 first-quarter release. Microsoft, for example, is expected to be hit hard.

Claris Takes Over HyperCard

CUPERTINO, CA — HyperCard is now a Claris product. With the transfer of HyperCard 2.0 to its software division, Apple has positioned the program to be sold and supported commercially for the first time. User groups, bulletin-board services, developers, and others who have distribution agreements with Apple can still distribute the program without charge, but starting in 1991, those distribution agreements will be made with Claris. Claris will also offer current HyperCard 1.x users low-priced upgrades. By the end of 1990, Claris is expected to release a commercial developer's version of HyperCard with extensive documentation, sample stacks, and code resources.

Chip Patent Perilous

LOS ANGELES, CA — In perhaps the most bizarre and unnoticed event of the year, Gilbert Hyatt, a previously little-known inventor and consultant, received a patent in July for a single-chip computer he invented in 1968. The patent could prove broad enough to cover every microprocessor made since then, which opens the door for a flood of lawsuits over who owns the rights to which chips. Hyatt, who already holds more than 50 other patents, is reportedly planning to negotiate licensing agreements with electronics manufacturers who use microprocessors in their products, but stiff industry challenges are expected. The patent in question, number 4,942,516, derives from several of Hyatt's previously rejected patent applications — one of which dates back to 1970. Prior to this patent, the invention of the microprocessor had generally been credited to a team of Intel engineers in the early 1970s.



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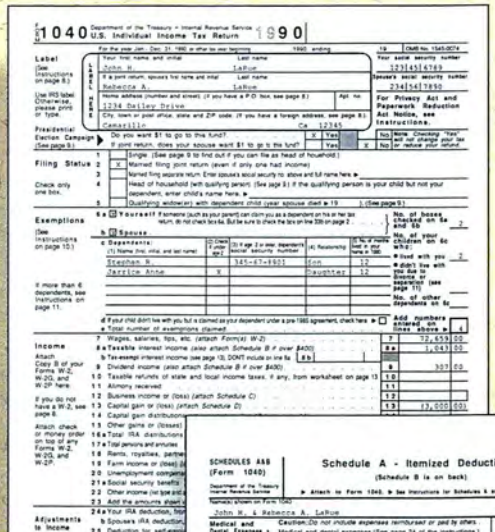
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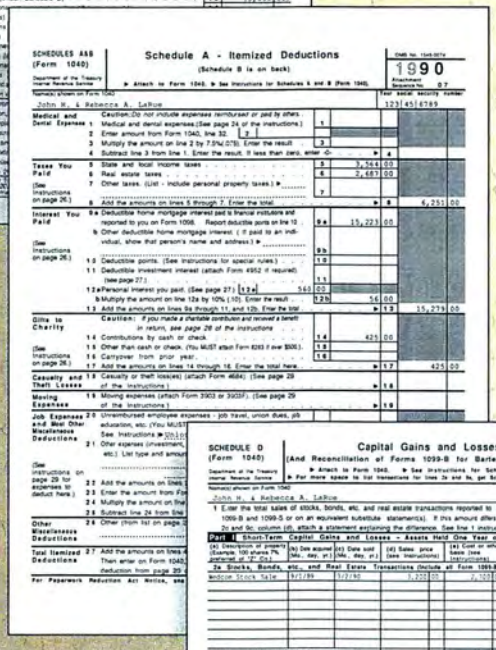
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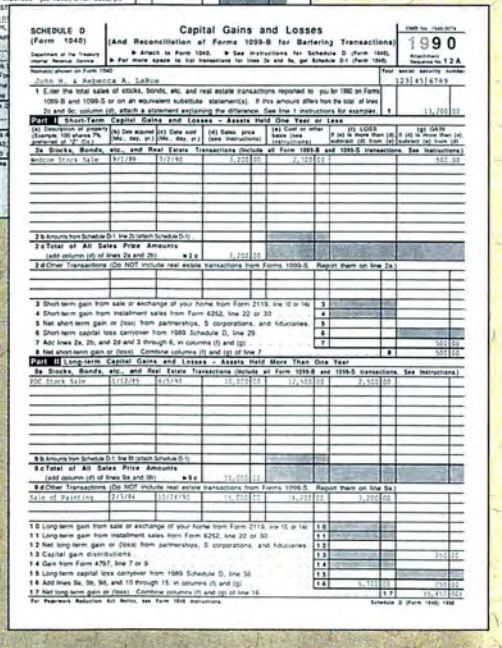
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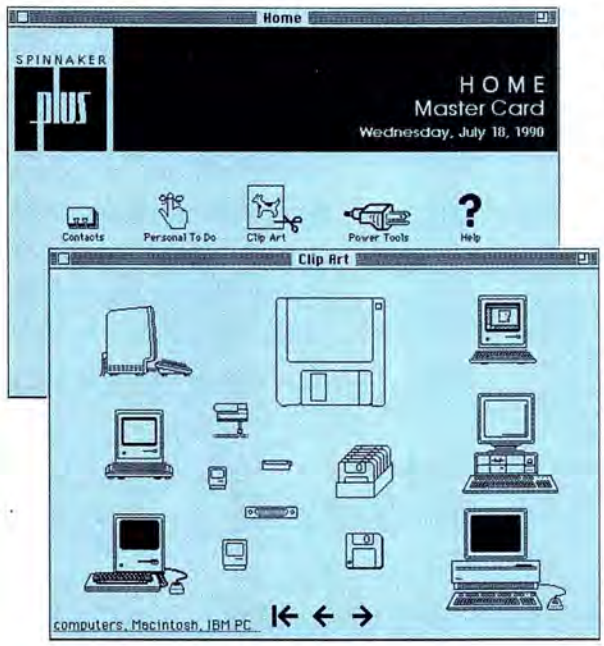
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HYPERMEDIA

Plus and SuperCard

Even in the latest versions, Plus 2.0's pluses and SuperCard 1.5's superiorities don't match HyperCard's.



Plus, the German HyperCard extension from Spinnaker, does its best to remind the user of its HyperCard compatibility — even to the point of suggesting you replace its Home stack (rear) with the genuine HyperCard model. Plus' Clip Art stack mixes familiar color and black-and-white images.

The challenge faced by the developers of HyperCard enhancements on the Mac has always been to add features that HyperCard lacks, without degrading performance. Last time out, Plus and SuperCard got only the first half right. This time out, their challenge was to complete the task.

Plus. From the beginning, Plus was intended to be an extension of the HyperCard model. It opens HyperCard stacks, uses the HyperCard metaphor and terminology, and has the same look and feel as HyperCard. With minor exceptions, each Plus version has included all the features and behavior of the concurrent version of HyperCard. If anything, Plus 2.0 moves even closer; the manual even suggests setting aside Plus' Home stack and replacing it with your existing HyperCard Home stack.

Plus extends the HyperCard model in two ways: by adding features and by providing platform portability.

Many of the advanced features in earlier Plus versions have been matched by HyperCard 2.0: resizable cards, support for large screens, rich text (more than one text font, style, or size in a single field), and a modal script editor. Plus 2.0 is still ahead of HyperCard in object graphics and color — neither of which is supported in HyperCard's latest release — and these are not insignificant features. Object graphics let Plus users/developers create graphic objects, as with a drawing program, and associate behaviors with them via scripting; Plus also supports scriptable bit-mapped graphic objects. HyperCard supports only bit-mapped graphics on the card and does not support scripting of graphics.

Still, there's not a lot new in this first release of Plus under the Spinnaker label. It has a new manual by Dan Shafer and a new set of utility stacks. The on-line help is restricted to help with PPL, Plus' programming language. The stacks include utilities such as an address book; a limited clip-art collection; a to-do stack; and Power Tools, a library of scripts you can invoke directly from within other stacks.

Another feature Plus has long had is something developers call hypertext. Plus generates a special message when the user Option-clicks on any word. The word itself is passed with the message, and scripts can be written to take appropriate actions for any desired words. The capability is still there, but now every competing product has some sort of support for hypertext, and although it's hard to say which technique is best, Plus' approach has some serious limitations.

In addition to original HyperCard-style fields for text, Plus also provides the specialized field types DBField and WPField for database and word-processing applications, respectively. Although HyperCard finally supports rich text in fields, Plus' specialized fields are unique. Version 2.0 enhances WPFields to support full justification and triple-clicking to select an entire line. Plus' WPFields are the closest thing to full-featured word-processing support in this product category.

Plus, SuperCard, and HyperCard are all moving toward full user control over windows, menus, and the like, so their applications can look like any other Mac application. Plus supports adjustment of the size and type of windows but provides no way to reconfigure the menus.

The most distinctive aspect of Plus is that its stacks can run without modification on a Mac or on a PC under Windows or OS/2. There are some understandable limitations — for example, external commands don't translate directly. But by sticking to PPL, Plus developers should be able to write one version of their stacks for all three environments. Version 2.0 now extends support for WPFields to Windows and OS/2. Because Plus can convert from HyperCard's stack format to its own, it also provides an avenue for moving HyperCard stacks to PCs, with this caveat: So far, Plus can read only version 1.x HyperCard stacks. No doubt support for HyperCard 2.0 is a top priority for the next release.

Unfortunately, Plus' performance hasn't improved significantly. Support for graphic objects and color has a performance cost, and Plus pays it. What users pay is a memory cost: Plus can boot up in 1 megabyte, but Spinnaker recommends that you have 2 megabytes to use it effectively.

SuperCard. Using SuperCard requires some rethinking on the part of experienced HyperCard users, particularly in SuperCard's development mode. It's really a different model for a different purpose. Like Plus, SuperCard's replication of the HyperCard environment is nearly intact, but it adds levels and

views that occlude the resemblance.

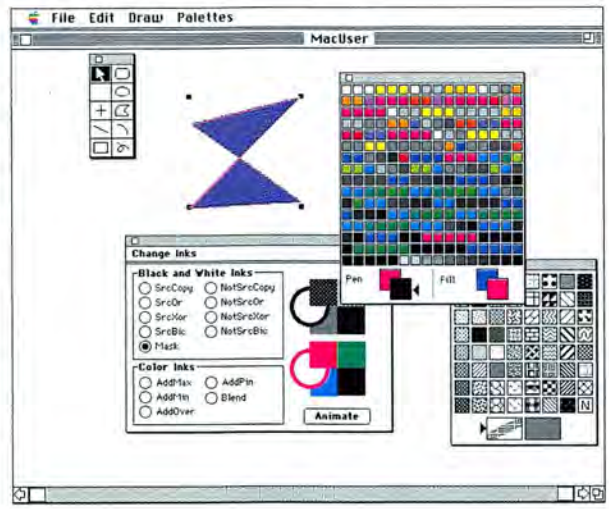
SuperCard's great strength has always been in the area of graphics. It has, for example, three specialized techniques for running animations, all of which have been upgraded in version 1.5. The **move** command lets you specify a set of points as a path for an object to follow, and the **play PICS** and **play STEP** commands play back files of animations stored in one of two formats. To allow you to create animations as well as play them, SuperCard lets you record sequences of cards to PICS or STEP files for subsequent playback. In version 1.5, the **move** command lets you move more than one object at a time, **play STEP** now supports different CLUTs (color lookup tables) for subtler color effects, and **play PICS** lets you specify a screen location for PICS animation.

SuperCard now supports two specialized field types called list fields and scrolling list fields. These fields, which have features such as scrolling by line rather than by pixel and permitting multiple discontiguous selections, are Silicon Beach's response to one of the most common requests for hypertextish features: the ability to select an item in a list and produce an action as a result. This ability is very useful, but as a nod to hypertext, it is not as friendly as Plus' or HyperCard 2.0's. SuperCard has several new and minor text features as well, including color text, which Plus has always had.

In earlier versions, SuperCard provided more control over user-interface elements, such as the appearance and number of windows and menus, than either HyperCard or Plus did, and it continues to do so. User-interface additions in version 1.5 include hierarchical items in menus, pop-up menus at specified locations, and changing menu contents at run time.

The development environment has improved significantly in version 1.5. The interpreter runs faster; the SuperEdit editor has many enhancements for ease of use; the run-time editor has been revamped; and there's a debugging aid called ScriptTracer, which lets you set breakpoints and trace messages and variables. It's also possible to write your own error-handling routines, because SuperCard makes error messages available to the scripter. SuperCard supports the library idea through a SharedFile.

Silicon Beach avoids the run-time-licensing issue for most developers by letting SuperCard package its run-time elements into a SuperCard *project* (Silicon Beach's terminology for what Apple calls a stack). This produces a large but self-sufficient stand-alone application. Version 1.5 lets stand-alones function as code libraries for other projects.



SuperCard's color capabilities have always been outstanding. A sample drawing program, written in SuperTalk, is included with the new release: It demonstrates SuperCard's fine color control.

Silicon Beach has done several things to improve performance. SuperCard no longer stores all of its data as strings but uses a numeric format for numbers, improving performance in calculations. Moving from card to card is now faster too. As with Plus, SuperCard is able to run in 1 megabyte, but you need 2 megabytes to take advantage of all the product's features.

The Bottom Line. Both products continue to offer capabilities that HyperCard lacks, although HyperCard retains a powerful price advantage — it's free.

SuperCard is an excellent tool for developing animated presentations and other graphically rich applications, and its control over the interface and ability to produce stand-alone applications distinguish it from any dedicated animation or presentation product. The performance enhancements and new development tools in version 1.5 make SuperCard a significantly more pleasant development environment when it's used with adequate horsepower and RAM.

Although Plus hasn't improved radically in this version, it still provides a simple and familiar HyperCard environment and adds object graphics, specialized text fields, and color support. For anyone who is familiar with HyperCard, the learning curve for Plus is virtually flat. Its greatest advantage for developers is its support for multiple platforms.

— Michael Swaine

[*At press time, Spinnaker had just announced the release of an unlimited, royalty-free run-time version of Plus. In fact, the publisher actually announced three run-time versions: one each for the Mac, Windows 3.0, and OS/2 Presentation Manager. The latter two, however, were not scheduled for release until after the the full developer versions for those machines began shipping. The Plus Runtime Distribution Kits are priced according to how many of the three platforms (Mac, Windows 3.0, and OS/2 PM) a developer wants to support. One platform costs $495; two, $900; and three, $1,250. — Ed.*]

Get Info

Plus

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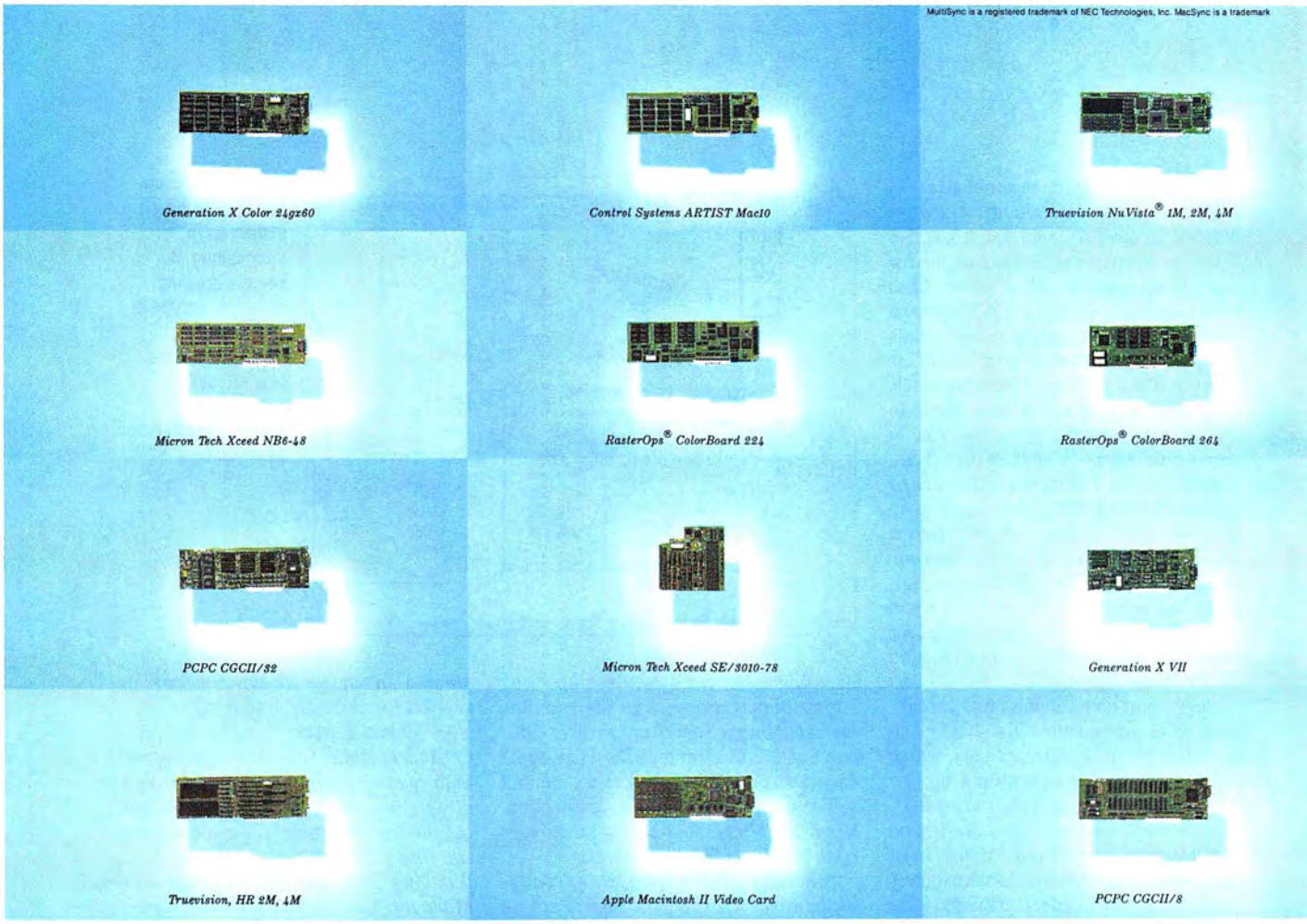
Published by: Spinnaker Software, One Kendall Square, Cambridge, MA 02139; (617) 494-1200.
Version: 2.0.
List Price: $495.

SuperCard

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Published by: Silicon Beach, 9770 Carroll Center Road, Suite J, San Diego, CA 92126; (619) 695-6956.
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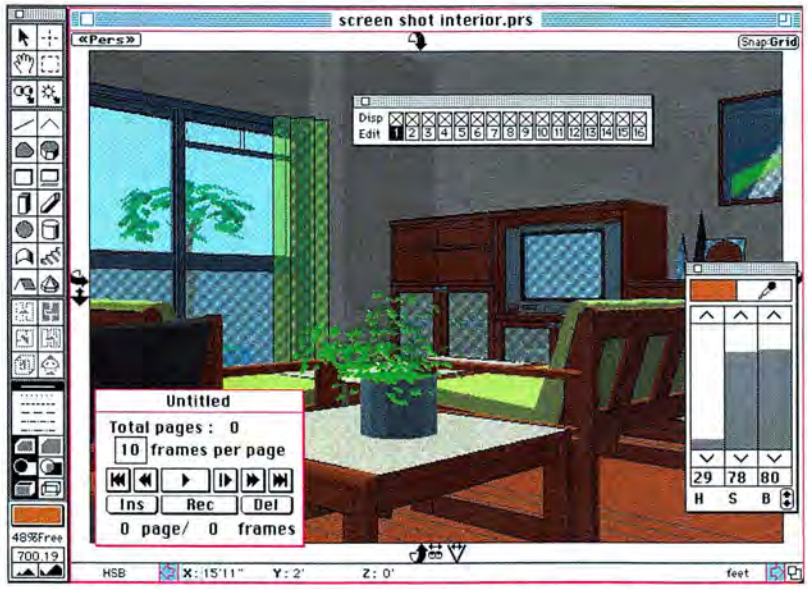
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CAD

DynaPerspective

DynaWare's second release packs a lower price and plenty of pizzazz for 3-D architectural presentations.



DynaPerspective's strength lies in its presentation capabilities. Its Rendered mode features transparent surfaces, easy color manipulation through the color controller (lower right), and quick animation creation through the simulation palette (lower left). Version 2.0 adds a more robust tool palette (left) and 16 layers. Clicking on one of the boxes in the layer palette (top) displays or hides items in that layer.

Several 3-D CAD programs can handle drafting, rendering, and presentations, but they usually specialize in only one aspect. Presentation was the forte of DynaPerspective 1.0 (July '89, page 47), with its ability to create fly-through animations easily. Although its rendering was basic but fast, its drafting capabilities suffered. With version 2.01, DynaWare has added needed features to DynaPerspective's drafting capabilities, tweaked its rendering, and made its animations faster and smaller. All this, and DynaWare has cut the price as well. DynaPerspective is still geared toward presentations, and version 2.01 makes it easier. There are a few interface annoyances and missing drafting features, but this upgrade takes several steps in the right direction.

Drafting Layers. The most important new feature is the addition of up to 16 layers, which you can display or turn off. This lets you, for example, put a basic floor plan in one layer, plumbing in another layer, and furniture in another or keep alternative designs for a single room. Layers are easily handled through the layer palette, and a Move/Copy to Layer command lets you move items between layers in one step.

The good drafting features of version 1.0 are enhanced in the new version. Four linked views representing floor plan, two elevations, and perspective can be displayed one at a time or simultaneously. A screen redraw stops when you click the mouse, so you don't have to wait whenever you make a change or switch views. You can now also redraw a single window.

Moving the light source or the point of view is simple with the new set-light and set-eye tools, which let you draw the line of sight on-screen with the mouse. You can now also save as many as 20 views at different angles, distances, and zoom settings as recallable views, which become choices in the View menu.

The zoom tool has improved, now letting you specify the zoom factor to within .01 percent. The old wall- and shape-creating tools are joined by new manipulation tools, including extrude, scale, revolve, multicopy, and move (an alternative to clicking and dragging). These mostly work fine, although I found the revolve tool difficult to master.

The *x,y,z* position of the cursor is displayed at the bottom of the window in an area called the Parameter Bar. When you select a shape-drawing tool, such as the wall tool, this is where you enter such parameters as the thickness and height of the wall. Dimensions can be entered or displayed in English or metric units. You can even set DynaPerspective to let you enter dimensions in one unit and have it display them in the other.

DynaPerspective's biggest void is a method for measuring relative distances. Right now, the Parameter Bar displays only the distance from the origin (point 0,0,0) and only when you create a new part. If you select an object and drag to modify the shape, no dimensions are displayed to tell you where you are. DynaWare is considering on-screen relative coordinates for a future version. Another problem is that there really is no easy way to modify walls once you create them. It's easier to delete them and recreate them.

Reality in Motion. Although rendering is not as fancy as in a program such as StrataVISION 3d, DynaPerspective is quite a bit faster and does include such niceties as movable light sources and transparent surfaces. Version 2.01 adds 24-bit color and anti-aliasing. If you need texture mapping, you can export your files in DXF format to StrataVISION. For ultrahigh-end rendering, you'll have to wait until the beginning of 1991, when DynaWare plans to have the capability of exporting to Pixar's Renderman.

Animations are easy to accomplish: You set viewing angles and distances in the perspective view and let the program interpolate frames between positions. Animations, also called films, can be recorded in two formats: DynaWare's new high-speed format and PICS. Films in DynaPerspective 1.0 format can be converted to the new format, which shrinks them to about one-fourth their original size. Films created in PICS can be exported to MacroMind Director. PICS



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files are about three times the size of high-speed-format films, however, and are limited to 16 megabytes. This is a severe restriction, as animations can easily exceed 100 megabytes. Anti-aliased 24-bit animations must be in PICS. Films can also be exported to video.

Animations can be played in three modes. If the film is small enough, you can load it into memory and play it from RAM at up to 60 frames per second. You can also set the film to load from the hard disk in chunks, which is a little slower. The slowest mode loads the film frame by frame from the hard disk. In this mode, I could play an 8-bit 100-megabyte film at 15 frames a second on a IIci, filling up a 21-inch screen. You can speed this up to 30 frames per second by creating the animation in a smaller window.

You also have a great deal of control over animations. You can speed up, slow down, stop, and reverse the film from the keyboard. The step-plate feature lets you jump between different viewpoints in the film. You can also set the animation to play continuously.

The manual has been greatly improved since version 1.0 and is well written and illustrated, with a lengthy tutorial. If this isn't enough, the program comes with a 40-minute tutorial videotape. It's probably a good idea to go through these aids before trying to tackle a major project.

The Bottom Line. For those of you with 2-megabyte Mac IIs, DynaPerspective 2.01 is a powerful, versatile tool for visualizing and presenting designs in architecture, interior design, and space planning. At its new price, DynaPerspective is a great value. Registered users of version 1.0 are well-advised to pay the $25 shipping fee to upgrade. And if you've always presented your designs with static drawings, think about using animation — DynaPerspective makes it a snap.

— John Rizzo

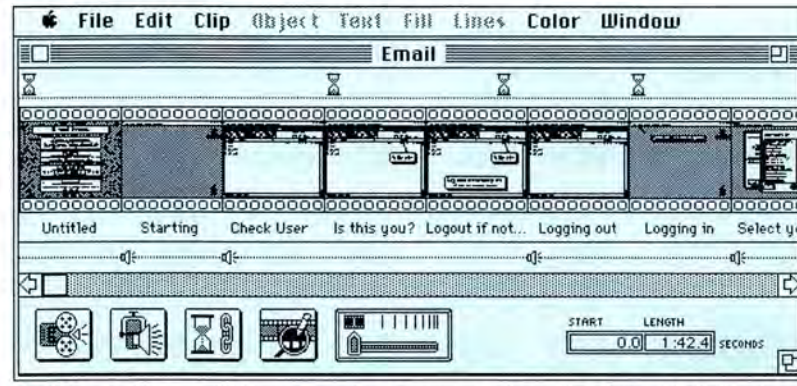
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MediaTracks

If you create Macintosh training programs or simple presentations, this is the ideal tool for you.



MediaTracks lets you edit ScreenRecorder sequences and combine them with digitized audio (such as MacRecorder SoundEdit files). Mark your clips first, rearrange them as needed, and add your sound all from this window.

Farallon's ScreenRecorder revolutionized training by making it easy to record on-screen work sessions — but something was missing. There was no way to edit a sequence, no way to add notations to a picture, no way to make a sequence interactive, and no way to turn a sequence into a double-clickable application. MediaTracks solves all these problems.

Making Tracks. The first task in creating a MediaTracks presentation is to record a screen sequence by activating the ScreenRecorder DA, which is included. A small control panel reminiscent of a VCR's appears. Click on the Record button, and you're prompted to name the tape. The panel shrinks to a small tape icon in the corner of the screen, and you can begin recording. Perform whatever action you want to record, and click on the tape icon to stop. When the control panel reappears, you can replay or rerecord your tape. If you have a large screen, you can shrink the recording area to a standard 9- or 13-inch size.

To edit a rough tape, launch the MediaTracks application and open the tape; you're then presented with a window that looks like a window in SoundEdit, MacRecorder's sound-editing software.

As you watch the tape, pressing a screen button (or *m* for *mark* on the keyboard) puts an edit point onto the tape, creating clips. Each clip can have its own name, sound, graphics, and actions. The clips can be rearranged, and every clip can also have an action attached to it.

To add a sound to a clip, just select the desired clip and click on the Record Sound button. You're prompted to either record the sound with MacRecorder or to import a previously recorded sound. If the sound is longer than the clip, you can pause (at the beginning or the end of the clip) for the sound to finish before resuming playback or it can overlap the next clip. The MediaTracks Record Sound dialog box tells you how long the recorded sound should be (depending on memory, sampling rate, and compression) and how long the selected clip is. (You can also select multiple clips.)

You can add simple color overlay graphics to a clip by double-clicking on a clip to bring up the drawing window. Here you can use typical MacDraw-like objects (text, lines, rectangles, rounded rectangles, and ovals) to annotate what's happening in the clip.

Another tool in the drawing window is the button tool, the real key to MediaTracks' power. You use it to define on-screen buttons, so you can have a clip pause and wait for a user action such as

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Two years ago, they called our Business LaserPrinter™ "The future of PostScript.®" Last year, they gave our PLP™ II the *MacUser* Editors' Choice Award. But this time, we're really giving them something to study. Because now, we've done what was considered impossible. We've produced a printer that dramatically outperforms the Apple® LaserWriter® IINT, at half the cost: the $2299* Business LaserPrinter II (BLP™ II).

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This is the printer you've always wanted, at a price you never thought you'd see. With true Adobe™ PostScript and built-in AppleTalk®, you and everyone else on your Macintosh® network can immediately start producing the highest quality, 300 dots-per-inch (dpi) graphics and text using your favorite software. You even get the same 35 fonts as you get with the Apple LaserWriter. But now, the real lesson begins.

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Even if money were no object, the BLP II would still be the printer of choice. It has 2 megabytes of RAM, user expandable to 4, plus a high-speed processor so it can image your document almost twice as fast as the IINT. And unlike the competition, the BLP II's SCSI port boosts performance and provides access to unlimited on-line fonts. Want more? How about a small footprint and silent sleep mode. Edge-to-edge printing. User-friendly LCD front panel display, cost-saving toner recycling system, and our advanced QuickEnvelope™ software that makes printing envelopes a snap. Still not enough?

The Fast Track: BLP IIS.

Maybe you have a large network, with a heavy print load. A network you thought required the speed, power and price tag of a LaserWriter IINTX. Well, think again. Because the BLP IIS gives you performance rivaling the IINTX at less than half the cost: an 8-page-per-minute printer for just $2799.* Whether you choose the BLP II or the BLP IIS, you get compatibility not only with Macintosh, but with IBM® and compatibles, using PostScript or the optional LaserJet II emulation. And you get it fast.

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Just call us toll-free. We'll give you the name of your nearest GCC Technologies dealer. Or order direct from us, with a 30-day money-back guarantee and $9 overnight delivery. And now, with our factory-direct rebate of $100 on both the BLP II and BLP IIS, your purchase is even smarter.

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02112B

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Up to Date

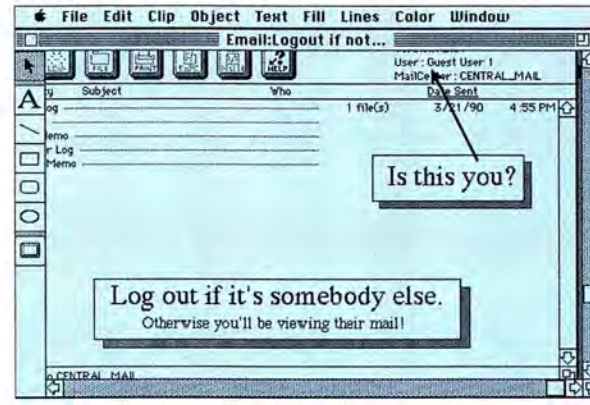
Changes New and Noted

After Dark, the first modular screen saver, has been upgraded to version 2.0 and now includes 30 modules, some of which have sound. Two new control modules extend version 2.0's capabilities by letting you run two modules simultaneously, either side by side or mixed together. You can also run several modules in a random sequence at user-defined intervals. SystemIQ is a major addition that optimizes After Dark during background operations and improves memory management. Berkeley Systems, 1700 Shattuck Ave., Berkeley, CA 94709; (415) 540-5535. $39.95; upgrade, $14.95 or free with $5 shipping-and-handling charge if earlier version was purchased after June 1, 1990.

Metamorphosis 1.5, which we mentioned in a note appended to our September '90 review (page 80), is now available. Altsys' type-conversion utility can now generate Type 1 PostScript fonts in addition to Type 3 fonts. Version 1.5 can also generate font outlines and fonts without a PostScript printer, creating its files directly from disk. Altsys, 269 W. Renner Road, Richardson, TX 75080; (214) 680-2060. $149; upgrade, free to registered owners.

Grammatik Mac, the giant grammar checker, has had its first Mac upgrade. Version 2.0's improvements include a more intuitive interface, a larger proofreading rule base, and a rule/help editor that lets users create their own custom writing rules and help. Reference Software, 330 Townsend Street, Suite 123, San Francisco, CA 94107; (800) 872-9933 or (415) 541-0222. $99; upgrade, free to registered owners.

Accutext, Xerox Imaging Systems' OCR package, has been bumped up to version 2.0. Some of the enhancements include improved performance, draft-quality-dot-matrix recognition, halftone removal that automatically eliminates pictures from a document's scan prior to recognition, an improved preview function, a HyperCard output option, and better error recovery. The HyperCard connection, called AccuStack, provides an easy link between HyperCard and your scanner that simplifies the creation of HyperCard databases. Xerox Imaging Systems, 535 Oakmead Parkway, Sunnyvale, CA 94086; (408) 245-7900. $799; upgrade, $10 if version 1.1 was purchased after August 1, 1990, or $90 if version 1.1 was purchased prior to August 1, 1990.



In addition to audio, MediaTracks lets you add visual annotations, such as the titles and arrows shown here, to your clips; buttons can be linked to other clips or even other sequences.

the press of a button and then branch to another clip in the tape or even to a completely different tape.

Buttons can also play sounds and control tape playback (pause, stop, skip, and so on). Farallon includes an XCMD that lets you play MediaTracks tapes from HyperCard. To help mesh MediaTracks with HyperCard, MediaTracks sends HyperCard messages when MediaTracks buttons are pressed or when clips begin.

Unlike ScreenRecorder, which requires that all users have the application to play back tapes, MediaTracks gives you several options. The MT-Player program can be distributed without charge (noncommercially, or commercially with Farallon's permission) for opening, playing, and pausing tapes. You can also save tapes as stand-alones. Tapes saved in this way have MT-Player built in, so you end up with a double-clickable application.

Minor Faults. MediaTracks' few faults are minor. First and foremost, it doesn't record on-screen color (even though you can paste color goodies into its draw layer), so you'll want to change your screen to black-and-white while you're recording. Although the 246-page indexed manual is great, there are some inconsistencies in the tutorial section that can be confusing. The MediaTracks editor lacks a frame counter (actually a QuickDraw-command counter), which would make it much easier to find a particular location on a tape or clip. (You can, however, single-step through a tape or clip.) Reusing sounds just duplicates the audio data, taking up extra disk space; pointers would've been much more efficient. Although the program works fine on normal Mac displays, it did have some problems with my RasterOps ColorBoard 108. Finally, if you have a large screen, you have to reboot to change the recording-screen size and reboot again to reclaim your expensive screen real estate.

MediaTracks is available in a software-only version ($295) for those who already have a MacRecorder; it is also available with a MacRecorder in the Multimedia Pack, which costs $495. If you already have ScreenRecorder, you can upgrade to MediaTracks for $50 (or $250 if you want a MacRecorder). By the time you read this, Farallon should also be delivering MediaTracks on a CD-ROM disc.

The Bottom Line. In MediaTracks, Farallon has created another great communications tool. It is a revolutionary program that is easy to learn, powerful, and versatile — everything we expect a Macintosh product to be.

— Ron Hipschman

[*As we went to press, Farallon Computing began shipping the MediaTracks Multimedia Pack CD-ROM version for $495. The package includes a complete MacRecorder Sound System, including a MacRecorder with all its software (SoundEdit, HyperSound, and the HyperSound Toolkit). The CD-ROM also includes ScreenRecorder and the MediaTracks editor, as well as MediaTracks demos, tutorials, and sample tapes. — Ed.*]

Get Info

MediaTracks

★★★★½

Published by: Farallon Computing, 2000 Powell Street, Suite 600, Emeryville, CA 94608; (415) 596-9000.

Version: 1.0.

List Price: Software only, $295; Multimedia Pack includes MacRecorder, $495.

THE FIRST LASER PRINTER TO COMBINE HIGH STANDARDS AND LOW COST. THE $1299* PLP II.



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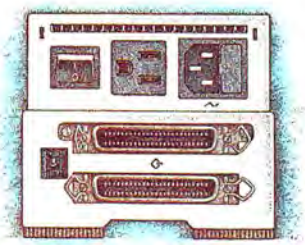
Protegé: A Hot Deal on



The Protegé from MacAvenue is everything you'd expect from the best drive in the business: quiet, cool, quick, elegantly engineered, tough enough to travel, and priced to move. But the single most important feature of this handsome little box has more to do with its ancestry than with our aggressive price.

The Protegé hard drive features an outstanding pedigree. That's because the parent company of MacAvenue is CompuAdd, a computer industry leader in every way that counts. In value, performance, service and support. CompuAdd's high quality and low prices have made it one of *INC. Magazine's* fastest-growing companies for three years running. So even though MacAvenue is a new kid on the block, we showed up with the smarts — and the resources — to build you the best drive in the business. And sell it to you for the best price on the market.

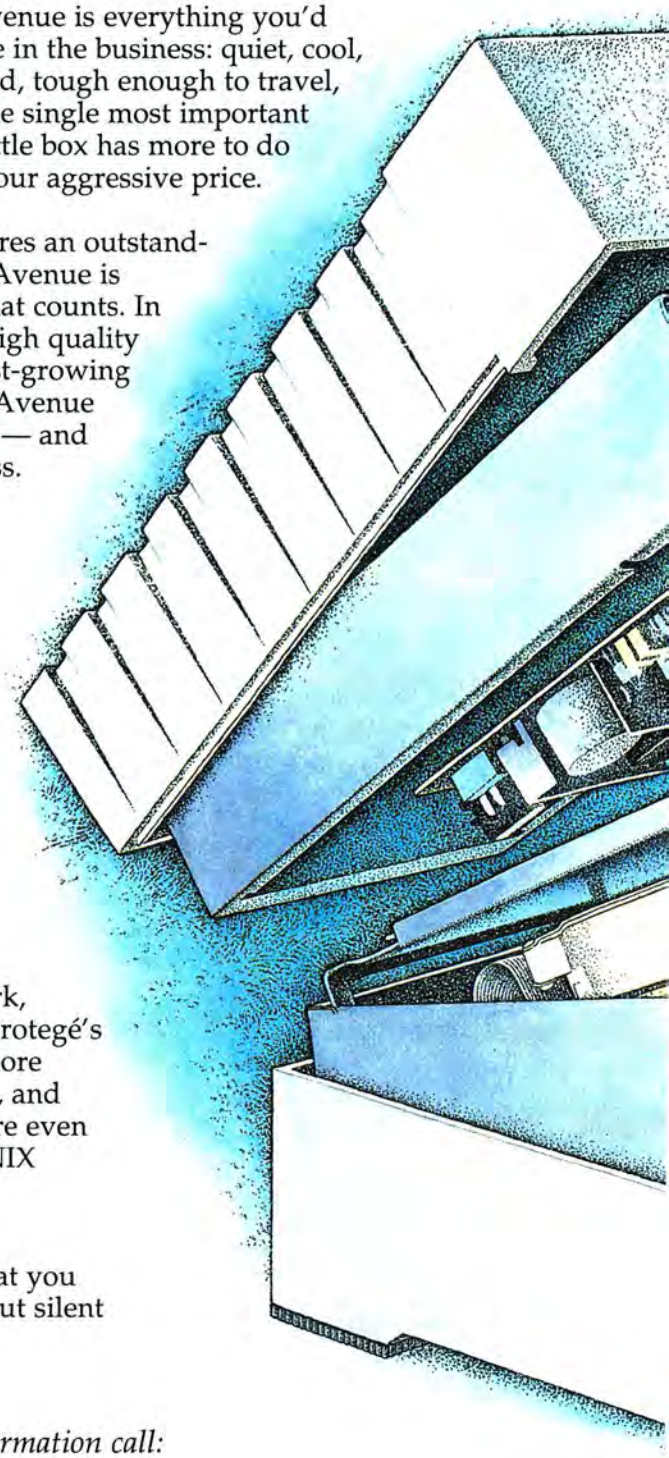
Here's how the Protegé will turn you on:



Attention to Details
Even the back of the Protegé is loaded with smart features. Like an extra power outlet for other drives or peripherals. A push-button SCSI ID setting. And an external terminator for convenience.

Loaded with Smart Software
Your Protegé will arrive pre-formatted and ready for work, loaded with easy-to-use, custom-designed utilities. The Protegé's Disk Management Software allows you to partition for more efficient drive operation, password protect each partition, and easily access partitions via the Control Panel. The software even allows for disk spanning and creation of ProDOS and UNIX partitions.

Hear a Pin Drop
And if you haven't dropped a pin, sit back and enjoy what you do hear. Nothing. The Protegé Hard Drive is the strong but silent type, engineered to work without a whine.

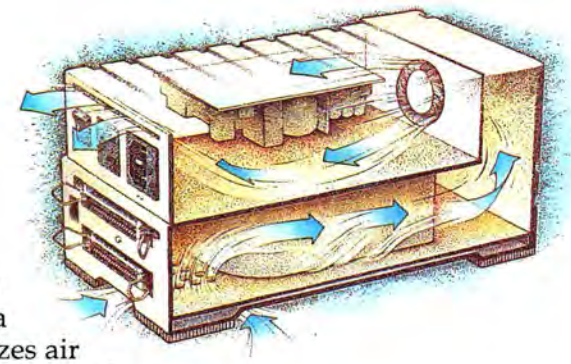


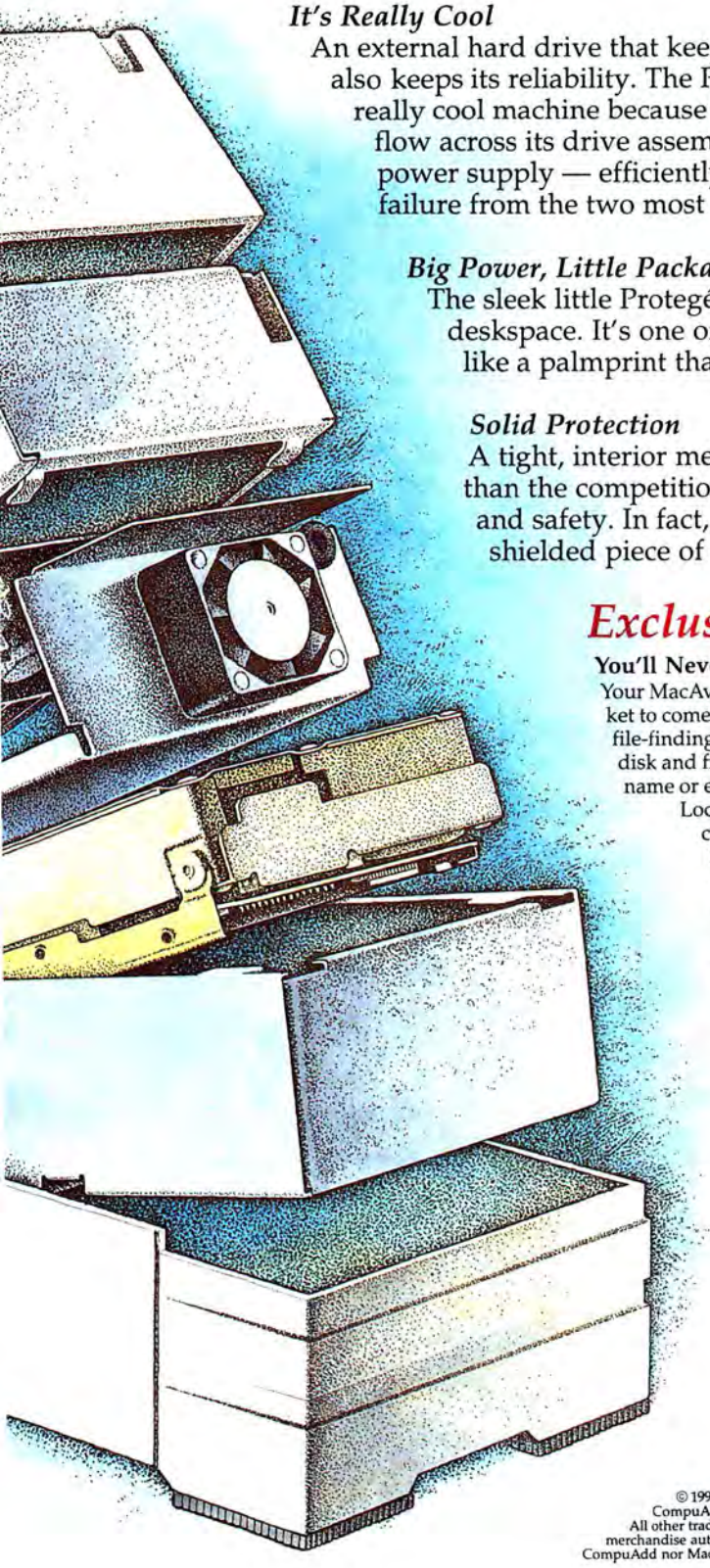
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a Cool Drive





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An external hard drive that keeps its cool also keeps its reliability. The Protegé is a really cool machine because it maximizes air flow across its drive assembly and its isolated power supply — efficiently cutting the danger of heat-related failure from the two most important parts of your drive.

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Your MacAvenue Protegé is the only drive on the market to come bundled with On Location, the amazing file-finding utility that will search your entire hard disk and find a lost file in seconds. Just type in a file name or even a few words within the file. On Location does the rest. This utility was created by Mitch Kapor, developer of Lotus 1-2-3. On Location is covered by a one-year warranty.

A $129.95 value.



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Like all MacAvenue products, the Protegé is backed by superior documentation, a 30-day, no-questions-asked guarantee, a one year warranty and a toll-free technical support line. So call now. And drive a bargain on the best drive in the business.

Protegé Hard Drives

Capacity	External		Internal	
	Seagate	Quantum	Seagate	Quantum
20+MB	$345	n/a	$295	n/a
40+MB	$395	$455	$325	$375
80+MB	$525	$645	$465	$595
100+MB	$649	$695	$575	$645

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UTILITIES

StuffIt Deluxe

The file-compression standard just got better.

StuffIt has been the standard Mac file-compression-and-archiving utility for years, a rare accomplishment for a shareware program. StuffIt Deluxe is the first commercial version of StuffIt, and it's bigger and better.

Getting Stuffed. The most bothersome things about the original StuffIt were that it opened only one archive at a time and that it was an application — you had to use MultiFinder to stuff files on the fly. Stuffing files with the original StuffIt required that you launch the application, create a new archive, name it, and then use another command to bring up a dialog box from which to select the files to include. The unstuffing process required the same number of steps.



StuffIt Deluxe is the next generation of StuffIt, the Mac file-compression standard. Its archive window displays applications, documents, and folders in much the way that the Finder does. The QuickStuff and QuickUnStuff commands are available on the Other menu.

Although StuffIt Deluxe still supports the old method, there are now two quick-and-easy ways to stuff files into a new archive. The QuickStuff command brings up a dialog box in which you can choose the file or folder you want to stuff. StuffIt Deluxe automatically creates an archive, stuffs your selection, and gives the archive the same name as your selection plus StuffIt's familiar standard .sit filename extension. QuickUnStuff works just as easily. You can even choose to check files for viruses as they are processed.

An even faster way to stuff files is available through Magic Menu, a Control

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From input to output, Hewlett-Packard leads the way. With a full line of Macintosh-compatible printer and scanner choices.

For photographic-quality scanning, there's the HP ScanJet Plus scanner. Combine that with one of HP's high-quality printers. The DeskWriter, the LaserJet III, the LaserJet IIP, or the LaserJet IIID. HP even has color printers. The PaintJet and the PaintWriter XL.

Plus, HP stands behind all their products with exceptional service and support. And a one year warranty. It doesn't get much better than that.

There is a better way.

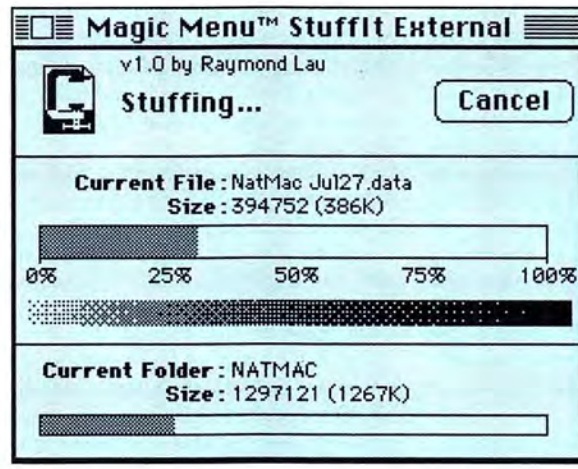
HEWLETT PACKARD



Panel file that places a menu called Magic in the Finder. Simply select the icons of the files you want stuffed or unstuffed in any Finder window, and click on the appropriate command in the menu. You never even open StuffIt Deluxe—because everything happens right on the desktop! Magic Menu can also automatically stuff and send files and E-mail without making you invoke your E-mail application; however, this feature works only with Microsoft Mail and QuickMail.

StuffIt Deluxe opens up to eight archives simultaneously. Moving files or folders among archives or copying them is the same as doing so on the desktop—just select and drag. For any open archive, you can stuff, unstuff, create a list of files to be stuffed in a single operation, delete, rename, copy, get info on or add comments to archived files, or create new folders.

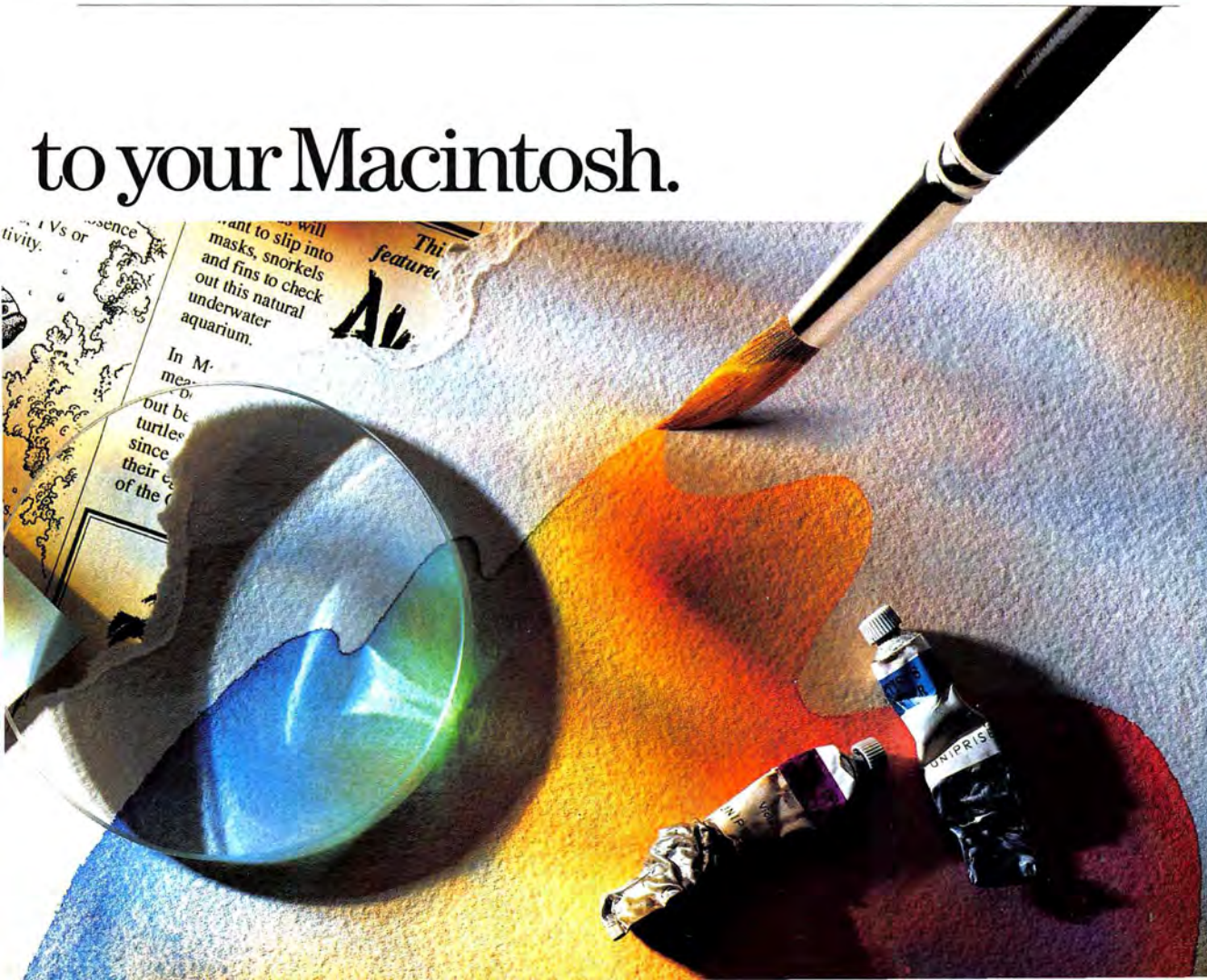
The package includes special viewers (translation software) that can display text and PICT files on-screen and print them without your unstuffing them. Aladdin expects to release viewers for additional file types in the future. Files that can be viewed have a magnifying glass beside their name in the archive window. You can copy information displayed in the viewer window to paste elsewhere. In any text-viewer window, the Find command helps you locate specific text and you can define the text's font and size. StuffIt Deluxe can optionally display text files with Read Me in their names immediately after you open archives that contain them.



The three status bars of StuffIt Deluxe's status window tell you the size of the current file and folder. The center bar grows with the completed percentage of the current file. The lower status bar appears only when you're processing a folder and tells you the completed percentage of the folder.

Multimenus. StuffIt Deluxe has both standard and expert menus. The standard

to your Macintosh.



© 1990 Hewlett-Packard Company PE12012

menus are preferable for most users, because they work without unnecessary complexity. The expert menus enable better control of file compression and security and let you decompress files created by other utilities. StuffIt Deluxe unpacks PackIt (.pit) archives and both encodes and decodes BinHex files for transmission over networks that support only characters that can be typed on a keyboard. You can also DeArc and UnZip files created on IBM PCs and compatibles with those popular PC compression methods, but you'll need translation software or a compatible Mac program to read them.

StuffIt Deluxe also offers archive encryption, which prevents unauthorized users from unstuffing archives. If you encrypt a file while using standard menus, StuffIt Deluxe automatically uses the NewDE encryption method, which Aladdin claims is faster and more secure than the National Bureau of Standards' DES method. With expert menus, you can select NewDE, DES, or a custom encryption algorithm. The first time you open StuffIt Deluxe, you are prompted to sign your name, using a pencil tool similar to MacPaint's. You can add that signature to any stuffed file as an additional security feature.

The more you compress a file, the longer it takes at either end of the process. With standard menus, StuffIt Deluxe automatically uses Fast compression, which is roughly equivalent to the compression of previous StuffIt versions. With expert menus, you can also select Faster, which applies less compression but really zips along, or Better, which sacrifices speed to achieve extra compression. You can also select No Compression or use custom third-party compression algorithms and compression optimizers to boost compression for specific types of files or for files from designated applications.

StuffIt Deluxe supports a scripting language to automate repetitive tasks, which you can do by using a recorder or by typing a script (or editing a previous script) in any text editor or word processor that saves text files.

The Bottom Line. StuffIt Deluxe is more flexible and capable than its predecessor with no increase in complexity. For me, the time the Magic Menu feature also has saved me has paid for the package. Although Aladdin intends to maintain the shareware version (to be called StuffIt Classic), you'll really prefer StuffIt Deluxe for its convenience and versatility.

— Darryl Lewis

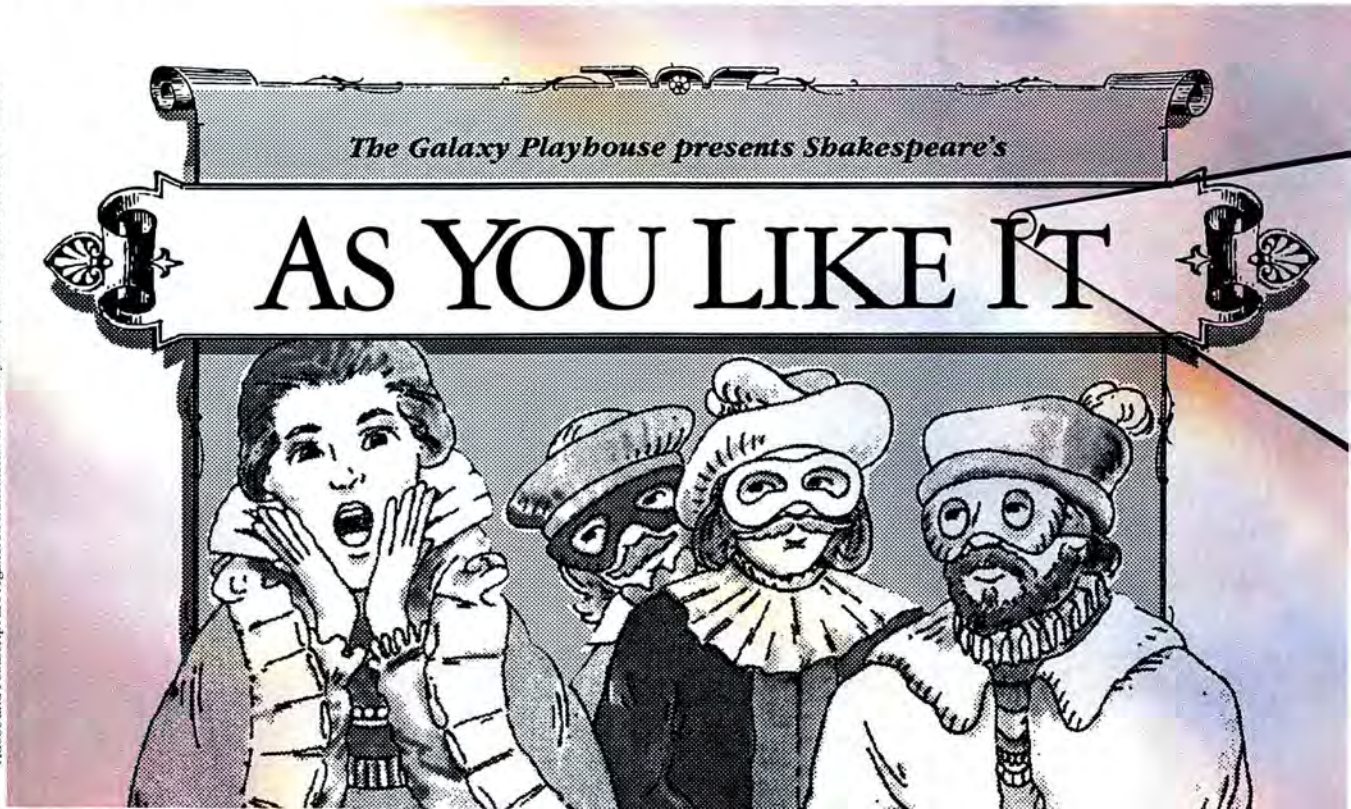
Get Info

StuffIt Deluxe

★★★★★

Published by: Aladdin Systems, Deer Park Center, Suite 23A-171, Aptos, CA 95003; (408) 685-9175.
Version: 1.0.1.
List Price: $99.95.

With the HP LaserJet III, you can



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*Serif depicted conceptually represents the benefit of variable dot sizes.
†Suggested U.S. list price for full Macintosh configurations including minimum required memory.
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STORAGE

Microtech R50

Slower, costlier, and SyQuest-incompatible, this Ricoh-based cartridge drive poses no threat to the existing standard.



The Microtech R50 is a 50-megabyte removable drive based on a Ricoh mechanism. The company claims a higher reliability rate, but the drive costs nearly twice as much as the cheapest SyQuest unit and is incompatible with that standard.

Removable media have two advantages over fixed-disk systems: infinite capacity — you just insert a new cartridge when one is full — and portability. SyQuest-based systems have dominated the market with their 44-megabyte cartridges, but now Microtech International has launched an effort to establish a second standard. Microtech is the first of several mass-storage vendors (GCC Technologies will follow shortly with a similar unit) to introduce a drive based on a new Ricoh mechanism that uses 50-megabyte cartridges.

Microtech is betting that customers will pay a premium for the Ricoh mechanism's reliability, which they might — if only the Ricoh drive were faster and cheaper than its competition. It isn't. And it isn't compatible with SyQuest cartridges either.

The New Kid. According to SyQuest, drives that are based on its mechanisms currently own more than 70 percent of the removable-media market, making it the de facto standard. The fact that the Microtech R50 can neither read from nor write to the ubiquitous SyQuest cartridges makes it a poor choice if you intend to share data with other users or service bureaus. If you are more interested in using cartridges for your own use or for archival purposes, then this incompatibility shouldn't concern you.

Standards do not necessarily indicate superior technology (witness the

refine your characters.

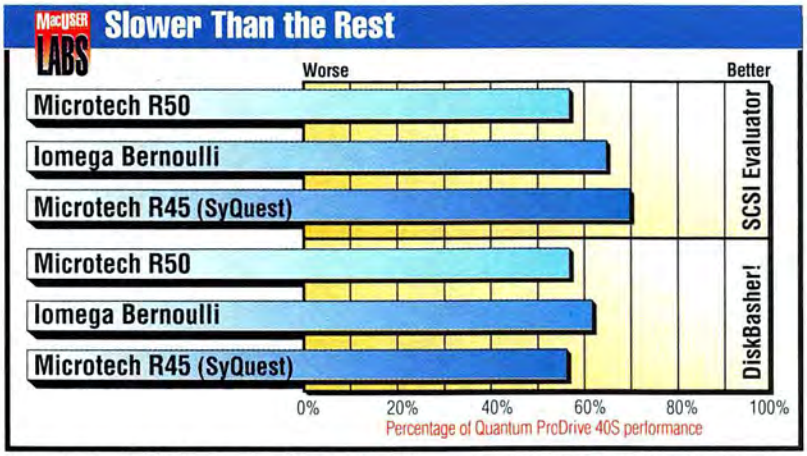


The HP LaserJet III printer delivers the most refined 300 dpi print quality ever. And it's easy to use. When configured with Adobe® PostScript® and AppleTalk interface, the LaserJet III is completely compatible with your Macintosh. All for only $3,700†.

HP offers other Macintosh compatible LaserJets. The new LaserJet IIID printer with increased paper-handling capability for $5,125†. And the affordable LaserJet IIP printer for only $2,595†. Call **1-800-752-0900, Ext. 1168** for the name of your nearest authorized HP dealer and ask for the Macintosh versions of the LaserJet line.

There is a better way.

HEWLETT PACKARD



In our test with SCSI Evaluator, Microtech's R50 was consistently slower than its competition. In fact, of the three removables tested, it was the slowest, finishing at just over half the speed of a hard-disk drive. The DiskBasher! results were less conclusive. The results were normalized to a Quantum hard-disk drive, which was used purely for comparison.

continued success of IBM clones). And SyQuest cartridges are generally regarded as less than perfectly reliable, to put it gently. The problem with SyQuest cartridges — which are basically hard-disk platters encased in removable plastic shells — is that they are susceptible to contamination. Whenever you insert the cartridge into the drive, a shutter on the cartridge flips open, letting the drive's read/write heads enter. At this point, dust and other particles can enter the cartridge and cause a variety of ailments ranging from intermittent data losses to full-blown head crashes.

The Microtech R50 features several safeguards that improve reliability and reduce, but do not eliminate, the risks of contamination. The Ricoh drive has an airtight design with a built-in filter to prevent particle contamination. Both the drive and cartridge are shockproof, and the shutter on the cartridge cannot be opened unless the cartridge is inserted into the drive. Some chinks in the armor remain, however. The read/write heads are still exposed whenever a cartridge is inserted or removed. And the actual cartridges don't have protective plastic storage cases; they come in sleeves like those of videocassettes.

Although the Ricoh mechanism appears to have a number of features that should improve reliability, it is an

With the HP ScanJet Plus, you've

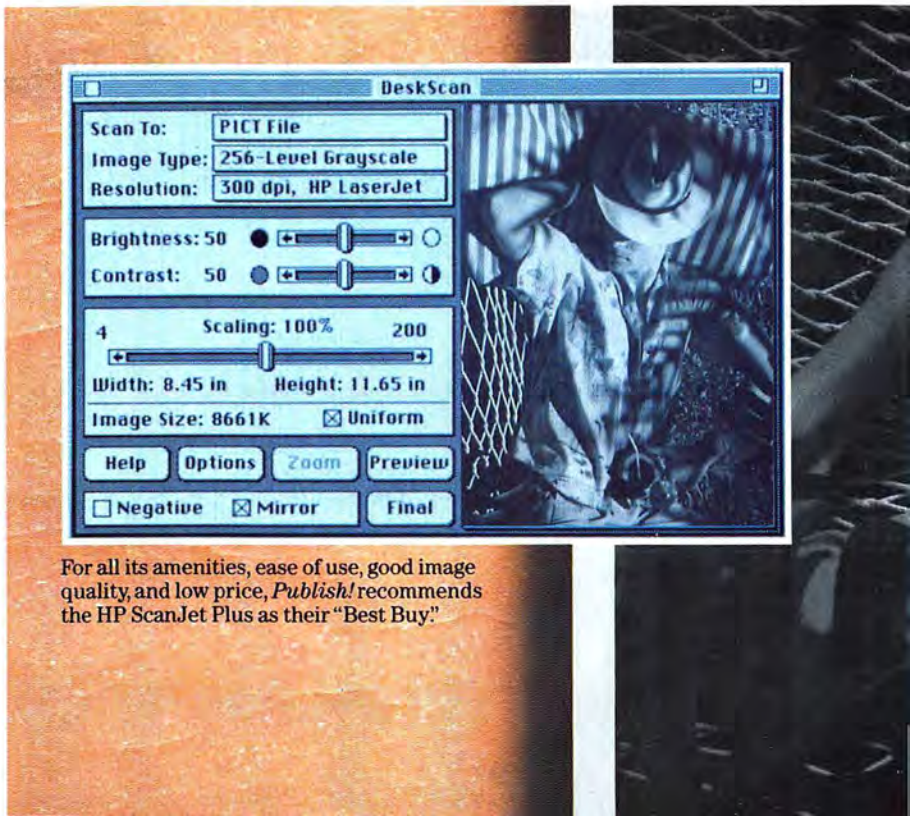
The HP ScanJet Plus scanner provides 8-bit photographic-quality scanning.

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For all its amenities, ease of use, good image quality, and low price, *Publish!* recommends the HP ScanJet Plus as their "Best Buy."

unproven technology. I experienced no difficulties with my evaluation unit, but until the drive is in widespread use, its reliability can't be confirmed. MacUser Labs plans to investigate the range of removable-media solutions in an upcoming report.

But we don't have to wait to determine the performance of the Microtech R50. Using the shareware utility SCSI Evaluator, MacUser Labs acquired read and write throughput rates for Ricoh, SyQuest, and Bernoulli removable-media drives. As a reference, a fast, 19-millisecond Quantum ProDrive 40S 40-megabyte hard-disk drive was also tested. Our tests show that the 25-millisecond Ricoh drive is about 40 percent slower than the Quantum drive; of the three removables tested, it was the slowest. MacUser Labs' DiskBasher! test results were less conclusive, with the Ricoh drive tying with the SyQuest unit, although both were slower than the Bernoulli drive.

The Good News. Microtech is obviously one manufacturer that values its customers and treats them well. The R50 package comes with everything you need to install and use the drive: a formatted cartridge, a 50-to-25-pin SCSI cable to connect the drive to the Mac, a 50-to-50-pin SCSI cable to daisy-chain additional devices, an external terminator block, Centa System's Total Recall ($99) for backing up data, and Norton Utilities for the Macintosh ($129) for file recovery and disk optimization.

The 50-megabyte cartridge is covered for one year, and the drive itself is protected by a two-year warranty. Furthermore, Microtech maintains an electronic bulletin board and a toll-free technical-support hot line. When the evaluation drive wouldn't mount, a courteous, knowledgeable staffer helped me diagnose the exact problem in less than five minutes (the SCSI-identification connector had come loose during shipping).

The Bottom Line. As an alternative to a SyQuest-based drive, the Microtech R50 can't be recommended. According to Microtech, its R45 SyQuest drive has a field failure rate of less than 2 percent — a figure that has been confirmed by data from thousands of units over several years of use. The R50, on the other hand, will cost nearly twice as much as the cheapest SyQuest units, and all you have to go on is a claim of higher reliability. With such a small failure rate for the de facto standard, it's hard to justify spending more money on a slower, incompatible R50, even if it does eventually prove to be more reliable.

— Owen W. Linzmayer

Get Info

Microtech R50

$$$

Manufactured by: Microtech International, Inc., 158 Commerce St., East Haven, CT 06512; (800) 325-1895 or (203) 468-6223.
List Price: Drive, $1,299; extra cartridges, $129.

got it made in the shades.



*Suggested U.S. list price. ©1990 Hewlett-Packard Company PE12004

GRAMMAR CHECKERS

Sensible Grammar

No grammar checker is completely idiomproof, but Sensible Grammar comes close.

The early versions of Sensible Grammar were hardly worth a second look. That's certainly not the case with version 1.6.0. It's a serious contender in the recently reignited Mac-grammar-checker race (see the June '90, page 59, and August '90, page 59, issues for reviews of four other proofreading programs). Sensible Grammar works somewhat differently from the other programs, in that it relies on rules and phrase dictionaries, or lists, rather than on rules and word dictionaries. This approach is both a major strength and a weakness.

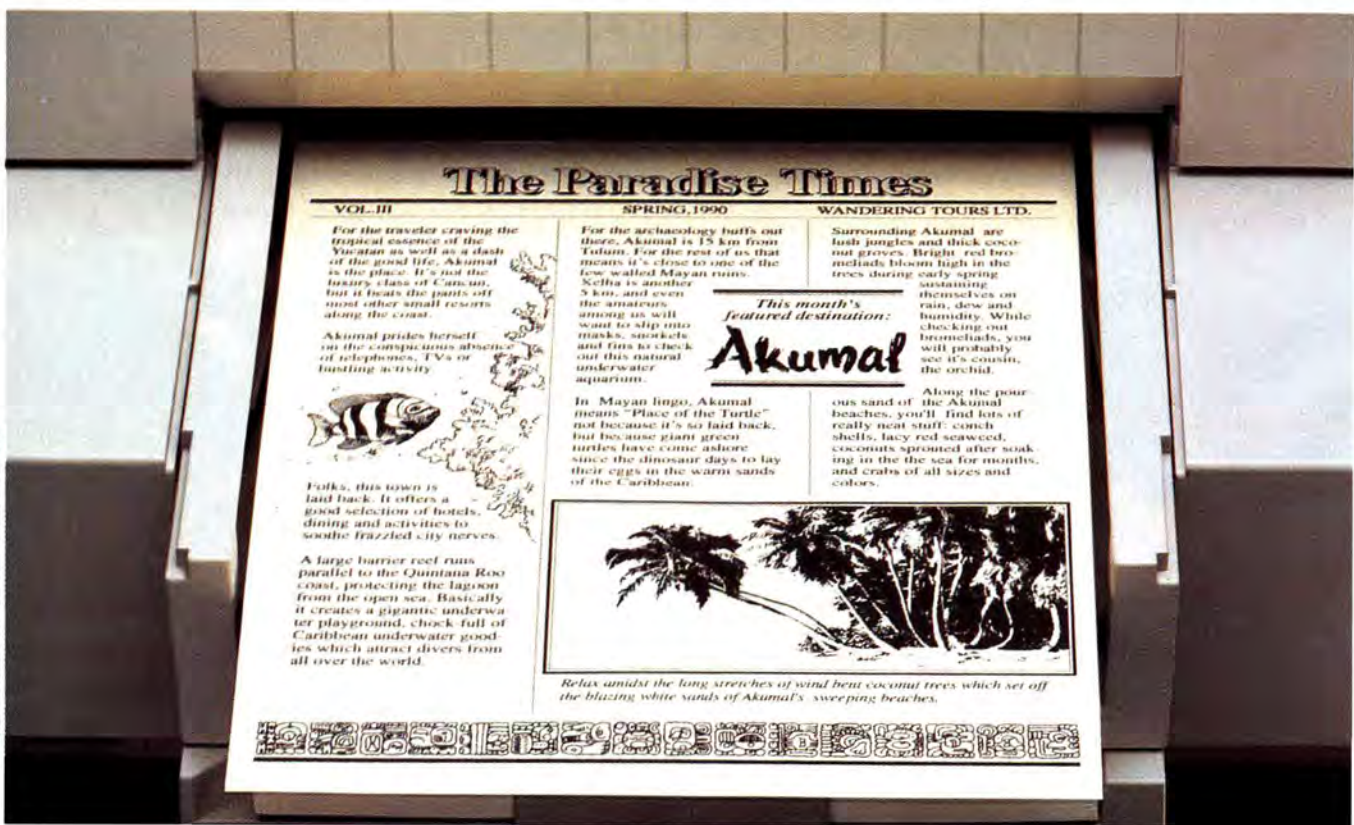
Idiom's Delight. When it comes to "correcting" informal language, too much can be as bad as too little, and no proofreading program is better than Sensible Grammar at catching and flagging idiomatic usage and not flagging contemporary usage. You can easily edit the phrase lists to reflect your personal style. The 20 lists contain more than 4,500 phrases, including clichés, confusing homophones, overly formal phrases, racial and sexist slurs, and legal phrases (the latter can be automatically removed). Because you can turn the phrase lists on and off, you can easily adjust the level of checking, depending on whether you're checking a formal report or an informal personal communication.

Sensible Grammar also has good punctuation-checking abilities, a category pretty much ignored by the competition. Another unique ability is the two-way conversion of abbreviations and contractions — that is, you can set Sensible Grammar to make your writing more formal by expanding all abbreviations and contractions. It can also make your work less formal by maximizing the use of contractions and abbreviations.

Its grammar-checking abilities are slightly above average. It can find most egregious errors. Although it has no built-in spelling checker, the program can catch homophones used incorrectly and double words. (However, you will probably want to edit the homophone list severely.)

The Proof Is in the Proofing. Operation is simple. Start by selecting either an entire saved document (file size is limited only by disk size) or a portion of a document (a very handy feature). Analysis immediately begins, and depending on which options you have selected, several windows open. Most are informational; all real work takes place in the Checking Document interactive

With the HP DeskWriter, you can

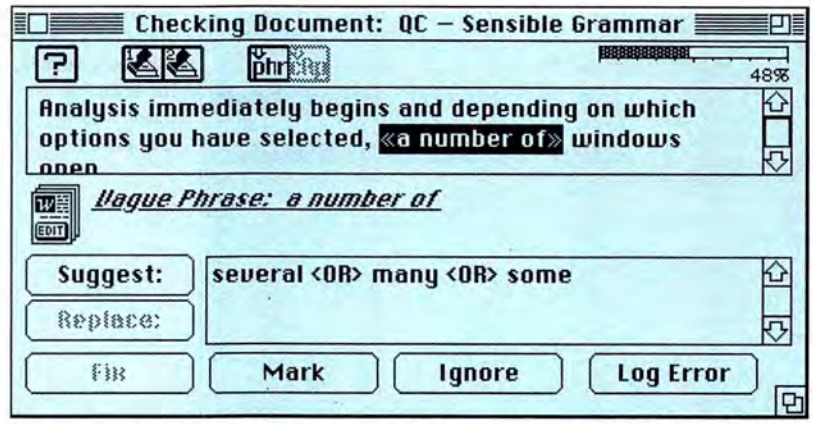


*Suggested U.S. list price. © 1990 Hewlett-Packard Company PE12005
Documents created using Microsoft® Word and Aldus PageMaker®
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window. This is a decent work area, showing the full sentence that contains each flagged item. Sensible Grammar would be better, however, if even more contextual material were shown. It also has too many marginally useful and cryptic icons. These icons let you access the phrase lists and rules that are currently in use. What looks like an on-line-help icon merely accesses the rules references; instead a small, very general Help file is available under the Apple menu.

The interactive window has buttons that let you try out suggested fixes and an editing area in which you can type in your rewrites and corrections. You can set the program to fix some classes of errors automatically. Flagged items can be ignored, logged to the various error logs, or marked for later consideration.

As you check, various indexes (readability index, word count, and so on) are updated to reflect results to that point in the document, which is remarkably useless, as all you're typically interested in are the final numbers.



Sensible Grammar takes a different approach to grammar checking, stressing idiomatic checking in addition to grammatical correction. This is the main working window. Suggest cycles you through a list of possible changes, and Replace enters the one you choose in the document. It's a little awkward, but you do get used to it.

The main operational drawback is that you work on the original document. Because Sensible Grammar preserves your original file by adding the suffix .Old to the filename and gives the changed file the original name, it's easy to get confused. Grammatik Mac uses the same, equally confusing, naming scheme. The program should give you an option to Save As rather than merely Save when a

have it all. (But keep it to yourself.)



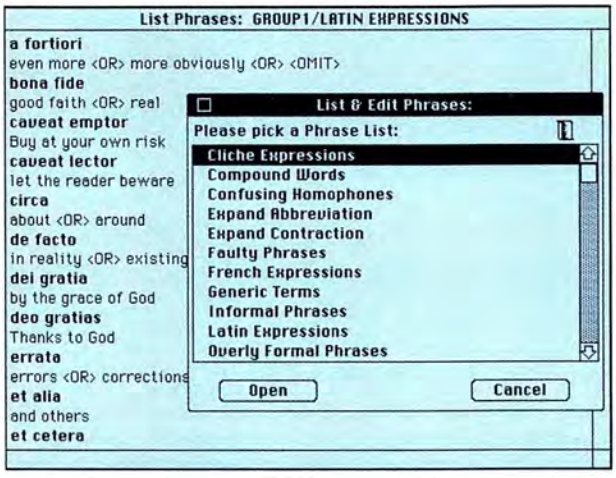
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Sensible Grammar's phrase lists are extensive. The Latin list shown here is easy to edit.

check is complete. Speed is reasonable, and Sensible Grammar didn't harm any of the test documents except for tables in Word 4.0, which lost some formatting.

Sensible Grammar runs on all Macs from the 512KE on up. It's not copy-protected and works best from a hard disk. It works with MacWrite 4.5, 4.6, and 5.0; MacWrite II; all versions of Microsoft Word (not fast-saved documents) and Microsoft Works; Microsoft Write; WordPerfect 1; PageMaker (up to 1.2 only); all versions of WriteNow; and standard text files.

The Bottom Line. Sensible Grammar is a good if somewhat unusual proofreading program. It is based more on phrase lists than on word lists and rules. It does not spell-check per se, although it can catch some spelling errors. The necessary customization (required of all proofreading programs) is easy, and selection of options is clear. This is a very — well — sensible and useful program, although it's not as powerful as Correct Grammar and the lack of a spelling checker is a major handicap.

— Steven Bobker

Get Info

Sensible Grammar

★★★½

Published by: Sensible Software, 335 E. Big Beaver, Suite 207, Troy, MI 48083; (313) 528-1950.
Version: 1.6.0.
List Price: $99.95.

Pigments for your imagination.

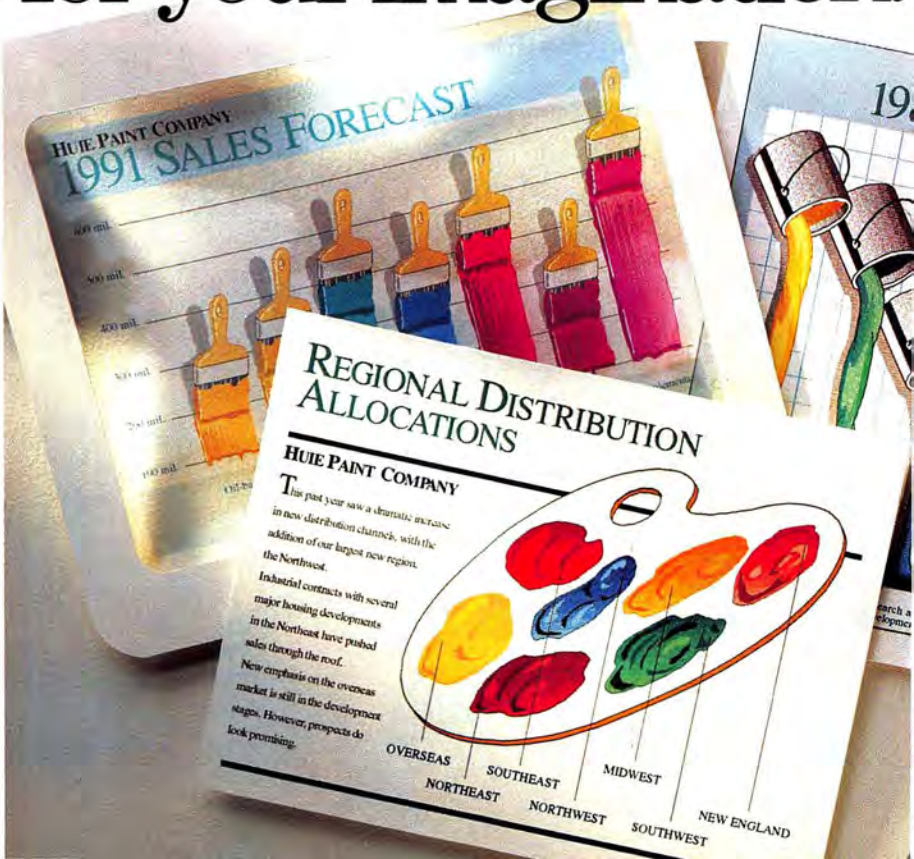
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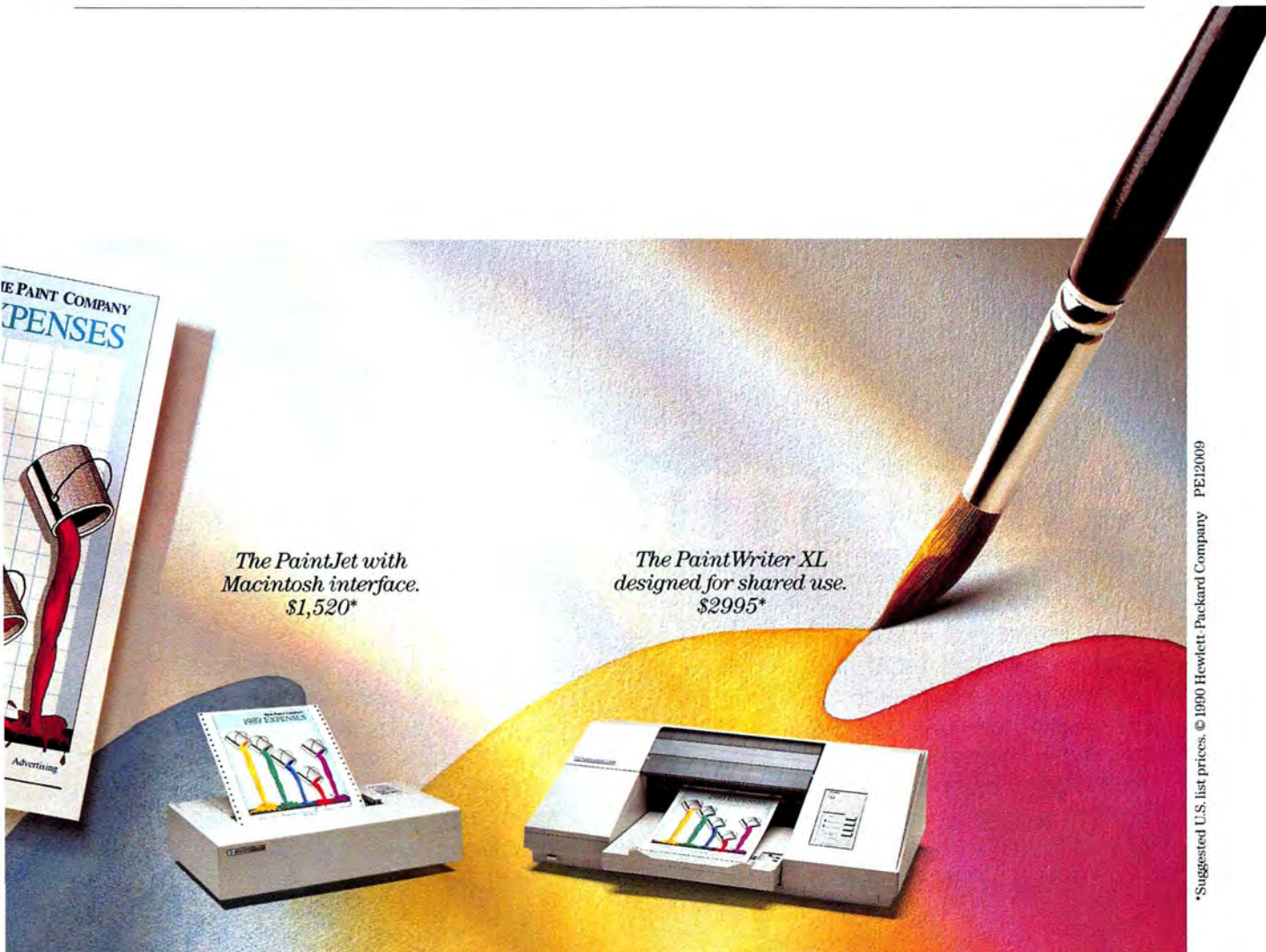
Oasis is the first 32-bit painting program that truly mimics traditional media such as oil paint, watercolor, chalk, and pastel. The effects are created with its impressive selection of brushes, which can be adjusted for size, transparency, wetness, and dry-out rate. The brushes are also pressure-sensitive and are compatible with Wacom's pressure-sensitive styli and digitizing tablets, which enables you to control line thickness and color density simply by varying how hard you press down when drawing on the tablet. A separate video module will offer features such as alpha-channel support, lockout of illegal colors, and video capture for RasterOps and Truevision video boards. For artists who have never been completely comfortable with standard mouse-driven graphics applications, Oasis may be just the ticket.

Time Arts, 1425 Corporate Center Parkway, Santa Rosa, CA 95407; (707) 576-7722. $795.
ETA: November 1990.

Desktop Video Production takes SuperMac's proprietary compression technology into the video realm. Using a combination of a fast LaserFrame optical-disc drive (or large-capacity hard-disk drive), a NuBus card to handle the compression and decompression, and a multimedia video-display card, Desktop Video Production lets developers work with 24-bit full-motion digital video — directly from their drives — on the Mac. The product can digitize and compress video signals on the fly, making it possible for developers and video professionals to work with live video quickly and inexpensively. Designed as a system for developers, Desktop Video Production promises to reduce the cost of video postproduction by as much as 80 percent. Although it's currently only a developer's product, user systems and applications may appear as early as summer 1991. Multimedia developers and video professionals should be interested in this system, as working with digital video has been highly impractical due to the massive storage required for uncompressed full-motion video.

SuperMac Technology, 485 Potrero Avenue, Sunnyvale, CA 94086; (408) 245-2202. Price not set at press time.
ETA: November 1990.







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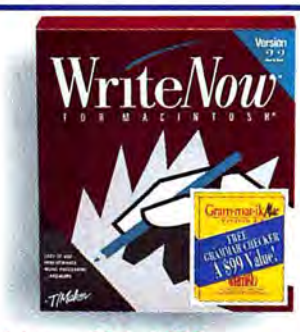
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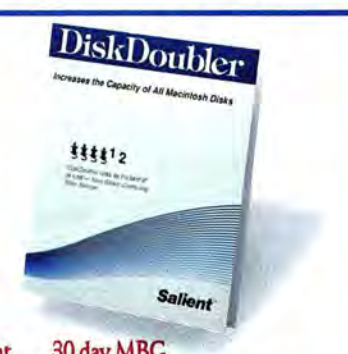
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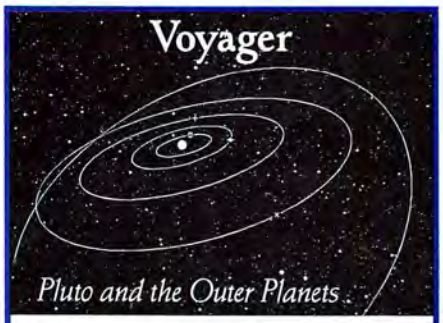
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★Farallon Computing ... 30 day MBG
5707 Timbuktu 3.1 95.
4867 Timbuktu 3.1 30-Pack 1285.
4866 Timbuktu/Remote 2.0 123.
6371 Timbuktu/Remote Access Pack . . 845.
5664 PhoneNET StarConnector 17.
6273 PhoneNET StarConnector 10-Pack . 129.
2203 PhoneNET Connector *(DIN-8)* 31.
4869 PhoneNET Connector 10-Pk *(DIN-8)* 198.
2206 PhoneNET StarController 300 825.
6687 PhoneNET StarController-EN 1599.
6766 MediaTracks 189.
6767 MediaTracks Multimedia CD Pack . 319.
6768 MediaTracks Multimedia Pack 319.

★Freesoft ... 60 day MBG
6115 White Knight 11 85.

Hayes
2300 Smartcom II 3.1C 84.
2307 Smartmodem 2400 349.
6655 V2400 Baud Modem 469.
5991 V9600 Baud Modem 719.

Information Presentation Tech.
8060 Personal Server Network *(PSN)* . . . 108.

Insignia Solutions
7557 Access PC 1.0 82.
7058 SoftPC-AT/EGA Module 125.
4089 SoftPC 1.3 245.

Intel Corporation
5119 2400EX Modem 179.
6265 2400EX with QuickLink II 195.
6420 2400EX MNP Modem 229.
6650 2400EX MNP with QuickLink II . . . 249.

★Kennect Tech. ... 30 day MBG
5631 Rapport 195.
7588 Drive 360 249.
7590 Drive 1200 249.
5632 Drive 2.4 *(includes FastBack II)* . . . 325.

★Microcom ... 30 day MBG
8027 MacModem V.32 $689.

★Microsoft ... 30 day MBG
5858 Microsoft Mail 2.0 Workstation. 83.
5856 Microsoft Mail 2.0 Server. 245.

★Nuvotech ... 60 day MBG
3000 TurboNet ST *(DIN-8)* 30.
6751 TurboNet ST *(12-Pack)* 279.
5277 TurboBridge 319.
6750 NuvoLink II 275.
6272 NuvoLink SC 309.

Orchid Technology
6949 OrchidFAX Modem 459.

★Practical Peripherals ... 30 day MBG
3102 2400 Baud External Modem 179.
5285 PM 2400SA MNP Modem 209.
3089 Mac Communications Pack 1.5 . . 225.

★Shiva ... 30 day MBG
3444 NetSerial X232 275.
4347 NetBridge 339.
4942 TeleBridge 339.
3443 NetModem V2400 429.
6917 NetModem V.32 1429.
6519 EtherGate 1629.



Farallon Computing ... 30 day MBG
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4188 TOPS Teleconnector *(DIN8)* 23.
4598 TOPS FlashBox 118.
3723 TOPS Mac 2.1 *(limited supply)* . . . 137.
3720 TOPS Flashcard 155.
7057 MacPrint TOPS Network Version 1.0 165.
6264 TOPS Networking Bundle 3.0 187.

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★Solutions, Inc. ... 60 day MBG
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7433 Scanner Kit w/Digital Darkroom . . 259.
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Software Ventures ... 30 day MBG
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6686 UPS 370ci 295.

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4476 OmniPage 2.1 539.
OmniSpell or OmniDraft *ea.* 69.
6661 OmniProof 105.

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7343 Mach IV Plus Joystick *(Quad or ADB)* 51.
7344 Rollermouse *(ADB)* 79.

★CoStar ... 30 day MBG
6090 LabelWriter 185.
6067 LabelWriter Labels 11.

★Datadesk ... 30 day MBG
6901 Switchboard *(modular keyboard)* . 159.
6813 Modular Trackball 98.
MAC-101 Keyboards *ea.* 129.

GDT Softworks
7687 Mac Daisy Link 59.
6256 PrintLink Collection 3.01 59.
6151 JetLink Express 2.0 89.

Hewlett-Packard
6514 HP DeskWriter Printer 759.

★Kensington ... 30 day MBG
Turbo Mouse 3.0 *(Plus or ADB)* *ea.* 109.



Kennect Technology ... 30 day MBG
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St. Louis, MO

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2566	System Saver Mac *(platinum)*	63.
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4643	Mac II Stand and Cable Kit	64.
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4623	Solid Oak Disk Case *(holds 90 disks)*	32.

★Mobius Technologies ... 60 day MBG

4470	Fanny Mac QT	55.

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2694	Moustrak Pad *(standard 7" x 9")*	8.
2692	Moustrak Pad *(large 9" x 11")*	9.
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3261	ImageWriter II Ribbon Multi-4-Color	9.
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4012	High Trek ImageWriter Carry Case	49.
4013	High Trek Mac Plus Carry Case	59.
4014	High Trek Mac SE & Ext. Kybd. Case	69.
4862	SE Protection Pak *(ext. keyboard)*	75.

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3618	ImageWriter II Carry Case	45.
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4015	Mac SE & Ext. Kybd. Carry Case	69.
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6375	3½" HD Disks 3 Pak *(30)*	56.
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THREE CHEERS FOR THREE NEW MACS

Sound! Video! Color! Speed! Apple-IIe-in-a-Mac! Prices that challenge low-cost PC clones! These three new Macs herald a bold new chapter in the Macintosh story.

No more excuses. The final barrier to owning a Mac — cost — has been lifted. On October 15, Apple introduced three new low-cost Macs: the Macintosh Classic, the Macintosh LC, and the Macintosh IIsi. At the same time, it retired three of the best-selling Macs ever — the Plus, the SE, and the IIcx — and demoted the IIx to special-order status. The hallmarks of the revised Mac lineup are power and affordability. The bottom line: Macs can compete across the full desktop spectrum — against low-cost IBM PC clones and powerful workstations — and they can compete in terms of both performance *and* price.

BY
RIK MYSLEWSKI,
WITH EDITORS AND STAFF OF
MACUSER AND ITS
LABS



PHOTOGRAPHY: FRED STIMSON

Macintosh Classic

Seven Macintosh computers remain, one for every need and budget (see Table 1). You can pick up a Classic for less than $1,000 dollars, or you can spend ten times as much for a top-of-the-line IIfx. The color LC gives you the power of a Mac II for the price of an SE, and for $599, you can plug in a new 12-inch color monitor. The IIsi provides 68030-class performance for around $3,700, and the IIci has dropped in price by up to $1,500. The remaining family members, the Mac Portable and the SE/30, are unchanged in both features and price — for now (see the "On the Horizon" sidebar).

The three new Macs are only part of the story: Apple also announced new add-in cards, new monitors, a new keyboard, new RAM-expansion kits, and new System software. Apple invited a team of *MacUser* editors and Labs staff to investigate this outpouring of new technology at its secret new-product stronghold. There we tested, disassembled, and inspected each new machine and accessory and then grilled their creators about hidden strengths and weaknesses. (Our analysis of the new products is based on evaluations of preproduction units; details that were still unresolved at press time are noted.)

Our testing sought not only technical details but also answers to some larger questions. What about the challenge of Microsoft Windows 3.0? Can low-cost Macs beat back the advancing horde of cheap DOS clones? And will Apple maintain its deserved reputation as the leader in innovative, truly *personal* computing? Although the final results are elusive, we did identify the beneficiary of Apple's latest offerings. It's you.

More Than Just Inexpensive

The Classic, LC, and IIsi are not just new Macs at attractive prices. The LC and IIsi, for example, are pioneers in a new era in personal computing that features the integration of the human voice. Both include built-in digital-recording capability and an attractive omnidirectional microphone (see Figure 1). Third-party developers are rushing to provide messaging, file-annotation, and voice-recognition applications to bring sound to every Mac user's desktop and network (see the "Bandwagon" sidebar).

All three new Macs include built-in video circuitry. The Classic — the successor to the Plus and the SE — continues the compact-Mac tradition with its built-in 9-inch monochrome monitor. The LC and IIsi follow the lead of the IIci and include on-board video circuitry to drive a variety of popular Mac monitors. In the new Mac family, only the flagship IIfx still requires an additional video card before a monitor can be hooked up. (The Mac Portable requires a third-party adapter to drive an external video display.)

It's a good thing that video cards aren't required for these new machines, because each follows Apple's original Mac philosophy of providing few or no expansion options (see Figure 2). The Classic, for example, has no expansion slot — although its unusual RAM configuration should allow enterprising developers to develop interfaces for large-screen monitors. The LC and IIsi each include a PDS (processor direct slot), waiting for third-party cards. Only the IIsi offers a NuBus slot — and only as an extra-cost option. That's the bad news.

The good news is that the LC's PDS accepts a new card that will warm the heart of educators and Apple II enthusiasts: the Macintosh LC Apple IIe Option Card (see Figure 3). This eight-chip beauty turns the LC into a fully functional Apple IIe, complete with connections for a 5.25-inch disk drive and joystick (see the "Apple-IIe-in-a-Mac" sidebar). But more on slots and cards in a moment. First, let's meet each new Mac.

On the Horizon

Any thoughtful, fact-filled analysis of Apple's activities is not complete without a good dose of unsubstantiated speculation. Here's what they're talking about on the street — be it Wall Street or the boulevards of Silicon Valley — when talk turns to predictions of Apple's next round of product releases.

Don't look for any new CPUs until the spring of 1991 at the earliest. At that time, Apple may have a new pair of Mac portables to crow about. These second-generation portables will probably come in two flavors: cheap and light or heavy and expensive. The evidence for the former comes in part from Apple's acquisition of technology from Outbound Systems. Although there was nothing in that purchase that Apple couldn't have done alone, why build when you can buy? The "Portable Jr." will probably weigh about 40 percent less than the current anchor-in-a-briefcase, and it won't be equipped with a fancy screen — a common backlit LCD like those used in DOS data buckets will be the order of the day. And for those still financially stable enough, the familiar Mac Portable will remain just as heavy and expensive but it will have a backlit screen.

For IIcx owners left out in the cold when the IIci became the standard-bearer in the modular line, a reasonably priced IIci-upgrade kit may become available. Some time in the summer, the first 68040 machines should make their appearance, but an upgrade kit for 68030 owners is unlikely.

Look for Ethernet to appear on the motherboard of machines from the low to the high end (the only exception being the Classic). Also, the new Mac LC appears to be an ideal candidate to become Apple's first diskless workstation. AppleMail, a system architecture for store-and-forward messaging (text, graphics, video, sound), will appear, most likely with a simple voice- and text-messaging application built on top of it.

On the software side, Claris should begin shipping its first products for Microsoft's Windows 3.0 operating system by early 1992 (a Win3 version of FileMaker Pro is the most likely candidate). And while we're on the subject of foreign markets, don't be surprised if Apple revives its interest in stylus-driven computers in an effort to bolster its business in Asia.

— Russ Ito

Low Cost, High Value

The Macintosh Classic is the perfect machine for users who don't require lots of muscle. If your work consists of processing words, telecommunicating, or using a simple spreadsheet program — and you're willing to trade performance for savings — you don't need a Mac more powerful than the confidently named Classic (see the "$1,000,000 Name" sidebar). If you use a IIci or IIcx at work and you want to tweak that sales-report spreadsheet at home, this may be the Mac for you — no more staying late at the office because you can't afford a Mac for home. Although the Classic doesn't give you the microphone and sound-recording capability of the LC and IIsi, third-party vendors such as Farallon and Articulate Systems can provide you with the low-cost hardware and software you'll need to take advantage of the coming age of sound input.

For some time, careful shoppers have been able to pick up a Mac Plus for less than $1,000. With the introduction of the Classic, the three-digit Mac is now official. With 1 megabyte of RAM and a 1.4-megabyte floppy-disk drive, the Classic sells for one dollar less than a thousand — and street prices should be substantially less than those of even the best Plus bargains.

But don't think of the $999 Classic simply as a lower-priced Plus. When equipped with 1 megabyte of RAM and an FDHD 1.4-megabyte floppy-disk drive — now officially named the SuperDrive — it's actually a repackaged SE with 95 percent of the SE's performance (see Figure 4) at 39 percent of its price. Or you can load up your Classic with 2 megabytes of RAM and a 40-megabyte internal hard-disk drive for $1,499 — that's more than $1,800 less than an equivalently equipped SE!

Like the SE, the Classic includes an ADB port to which you can connect a mouse, the newly redesigned Macintosh keyboard, and other input devices (see Figure 5). Unlike the SE (and all the other members of the Mac family except the Portable), the Classic — along with the LC and IIsi — has only one ADB port, so you must attach your mouse to your keyboard. Our editors and technicians were divided about the new keyboard — its soft touch was judged ideal by some and mushy by others. Also unlike the SE, the Classic has no PDS or on-board SIMM slots for RAM expansion. Any expansion cards — RAM or others — must use the Classic's unique (and, at press time, unnamed) system-memory slot. We know of at least two developers — Computer Care and Lapis (see the "Bandwagon" sidebar) — that have teamed up to supply a full-page display/video-RAM card for this slot. Computer Care is also developing two RAM cards: one incorporating a RAM disk along with system memory and the other supplying only additional system memory.



Figure 1: This omnidirectional microphone (shown alongside the familiar ADB mouse), coupled with digital-recording hardware inside the LC and IIsi, ushers in a new era of voice messaging, file annotation, spoken passwords, and voice recognition.

With the 2-megabyte Classic configuration, Apple provides a small card that can occupy the as yet unnamed system-memory slot. This card contains an additional 1 megabyte of RAM and two standard SIMM slots. Slip two 1-megabyte 150-nanosecond SIMMs (the same speed as the SIMMs used in the Plus and SE) into these SIMM slots, and you reach the Classic's limit of 4 megabytes of RAM. If you get a 1-megabyte Classic, you'll probably want to buy the optional memory card, because a 1-megabyte Classic doesn't have enough RAM to run Apple's upcoming System 7.0. A 1-megabyte RAM ceiling also makes it essentially impossible to do any useful work when you're running MultiFinder.

The Classic's power supply has been redesigned for more reliability than that in the SE or Plus. The redesign has introduced one minor deficiency, however: The new power supply can't handle a big power surge just as the machine is starting up. As a result, internal hard-disk drives are forced to wait about a second before they turn on. This delay will be imperceptible to users, but third-party internal drives for the Classic will be in limited supply until hard-drive vendors have redesigned their drives to include a delay circuit.

Also missing is a hard-drive-indicator light on the Classic's front panel, although some hard-disk utilities (Norton Utilities for the Macintosh and Silverlining, among

others) supply on-screen indicators — which you can turn off if you find them distracting. And while we're talking picky details, the Classic's 9-inch monochrome display has no external brightness knob, as did the displays of the SE and Plus, which it replaces. Display brightness is controlled by a cdev — a "feature" not seen since the venerable Lisa.

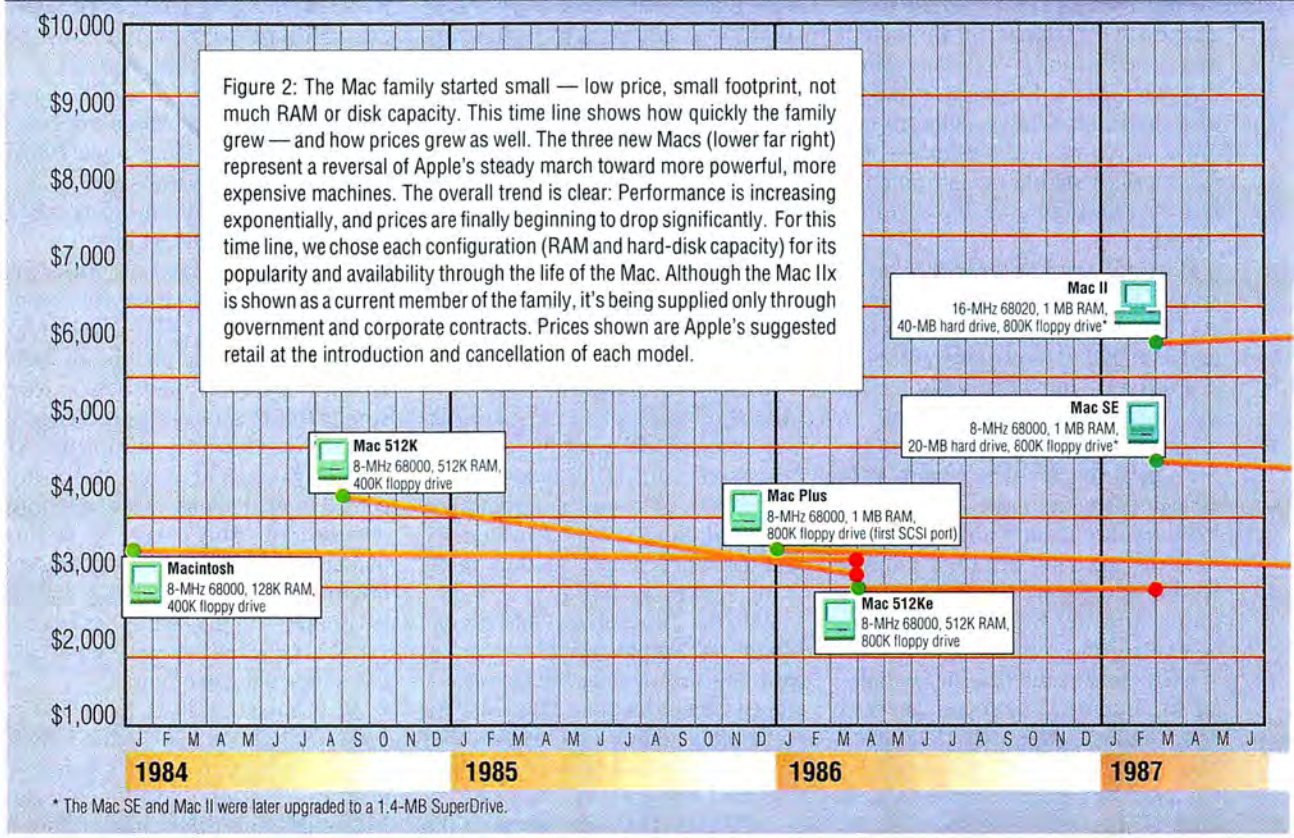
Low-Cost Color

The next new Apple offering we consider here, the Macintosh LC, is the ideal mass-market office machine — and its Apple IIe Option Card makes it no slouch in the K–12 (kindergarten through high school) market either. If you need color on your desktop and don't require the power of a high-end IIsi, IIci, or IIfx, the LC is the machine for you. And if you're a corporate volume buyer looking for a way to forever liberate your office staff from IBM Selectrics while giving them the power to — dare we say it — be their best, buy 'em each an LC, and you'll be an instant hero.

The LC is the real showstopper of the new CPUs — a very versatile machine (see Figure 6). With a 16-megahertz 68020 microprocessor and on-board video, it performs most day-to-day jobs as well as its 68020 ancestor, the Mac II, did — even though the LC doesn't include the Mac II's number-crunching FPU (floating-point unit) math coprocessor. The LC's motherboard is extremely compact and reliable, because of its low chip count and the addition of four new custom chips that do the work of a whole handful of older chips. The LC — without keyboard or monitor — weighs just over 8.5 pounds, half the weight of the Mac Portable. With the addition of an LCD display (rumored to be under development by a third-party vendor), the LC could become a very "transportable" alternative to the SE/30 and Mac Portable — and unlike with the Portable, you can hook the LC up to a color monitor when you get to your destination.

Although it was announced along with the Classic and the IIsi, the LC will miss the Christmas shopping season — it won't be on your dealer's shelves until January 1991 (the other two machines are available immediately). When it appears, the LC will be available in only one configuration: with 2 megabytes of RAM and a low-profile 40-megabyte hard-disk drive ($2,499). The RAM is soldered onto the LC's motherboard, along with two SIMM sockets ready to accept either 1- or 4-megabyte 100-nanosecond SIMMs (256K SIMMs are not supported on the LC). A pair

Figure 2: The Mac Family History



* The Mac SE and Mac II were later upgraded to a 1.4-MB SuperDrive.

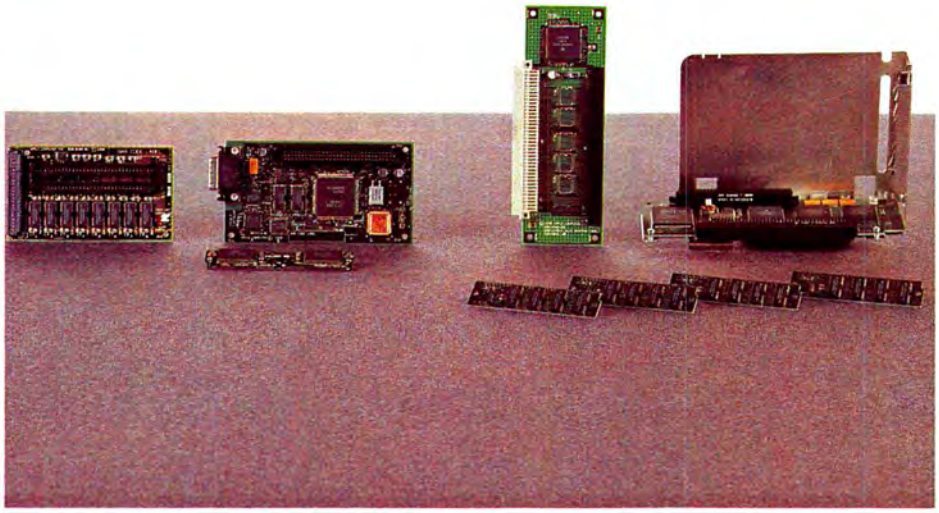


Figure 3: Optional add-in cards give the new Macs added power. Back row, left to right: A memory card for the Classic includes two SIMM slots with 1 megabyte of RAM. The Macintosh LC Apple IIe Option Card allows the LC to emulate an Apple IIe, and the Macintosh LC 512K VRAM SIMM (front) boosts the LC's color-video capability. The Macintosh IIsi 030 Direct Slot Adapter (center, vertical) and NuBus Adapter Cards allow third-party expansion cards to be used in the IIsi; both include an FPU math coprocessor. In the foreground is the Macintosh IIsi/IIci 2 MB Memory Expansion Kit of four 512K SIMMs (an 8-megabyte kit of four 1-megabyte SIMMs will also be available soon).

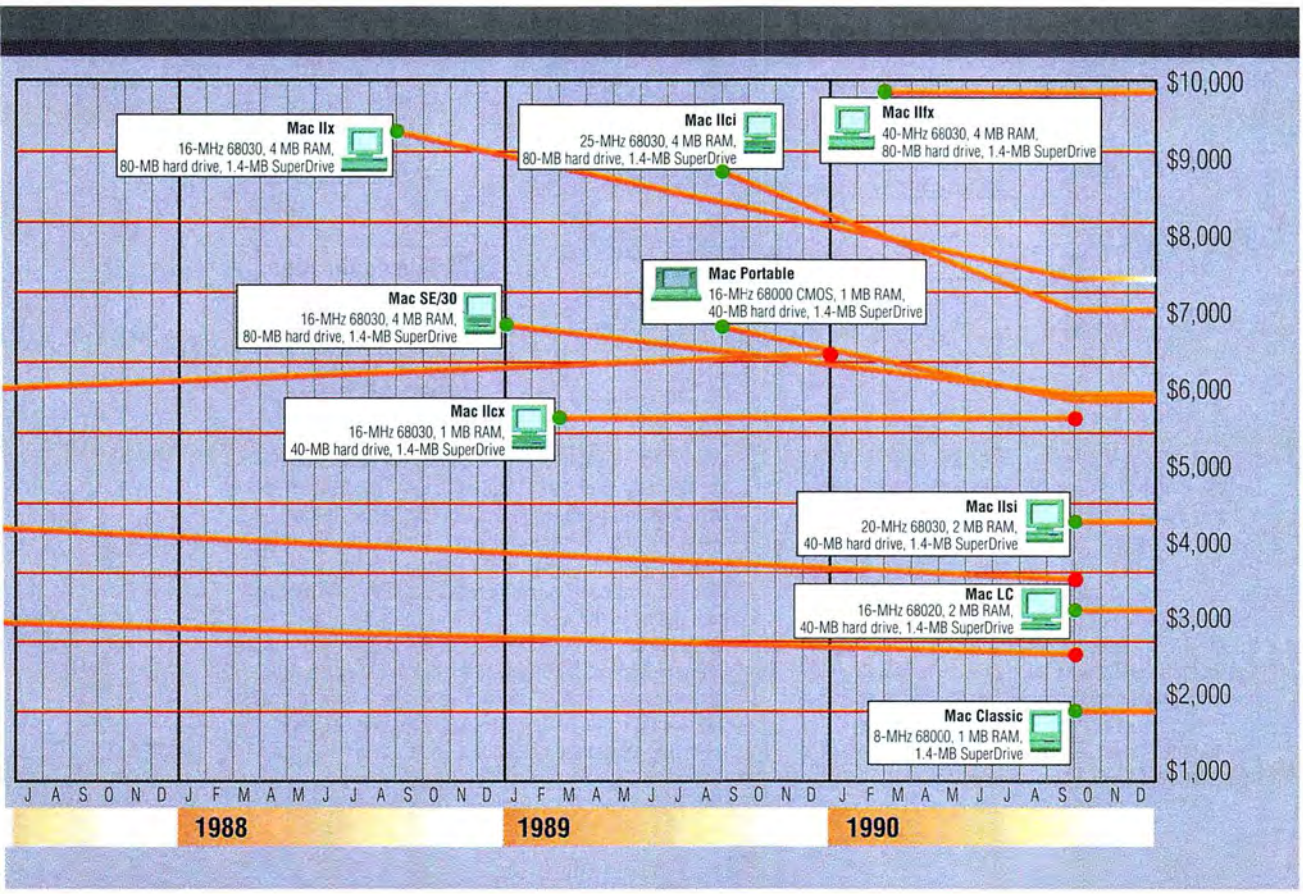


Figure 4: Mac-Family Performance

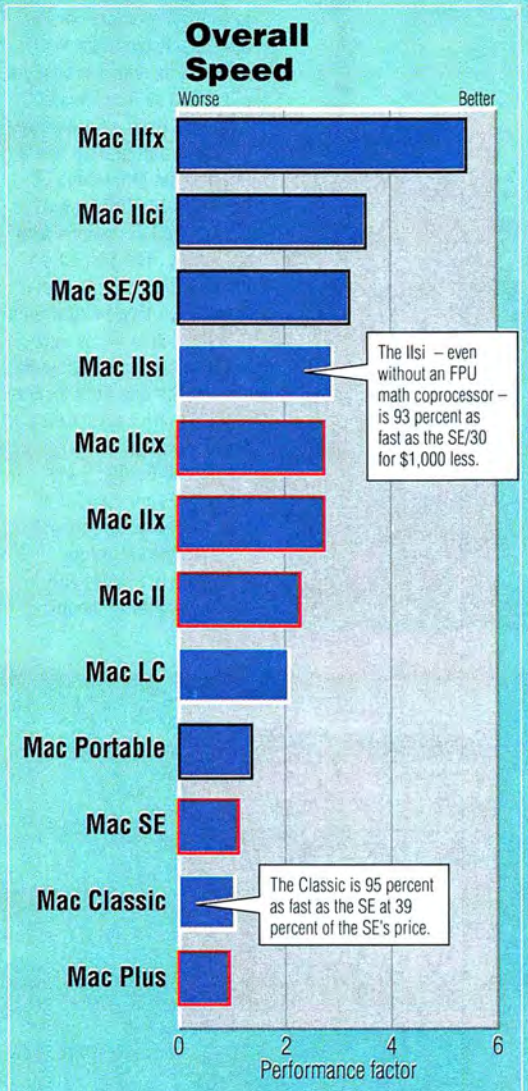
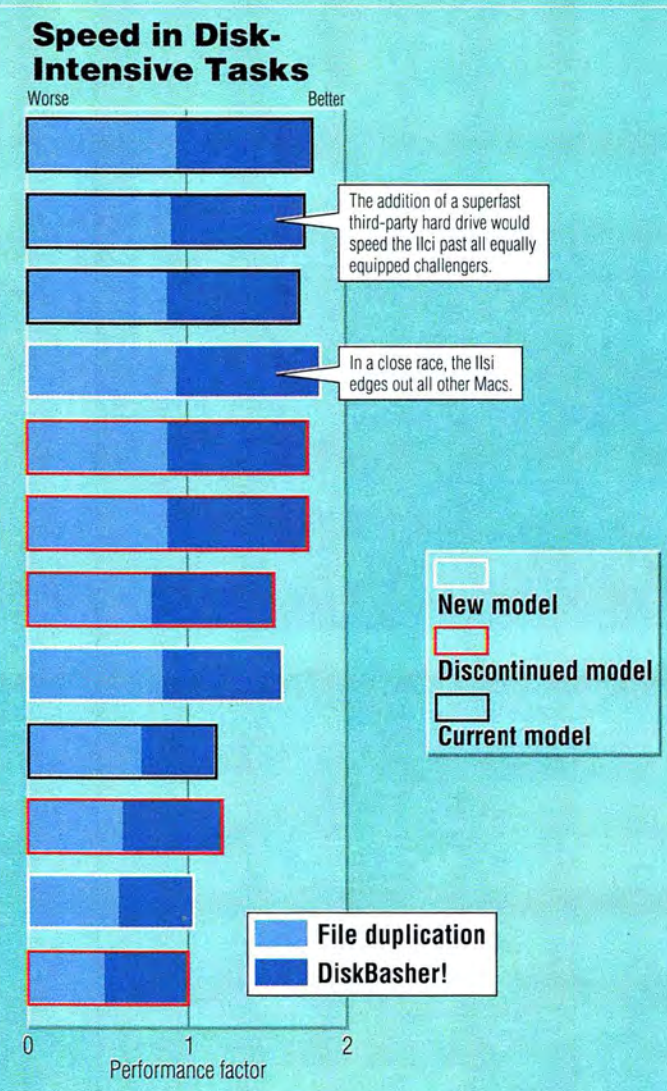
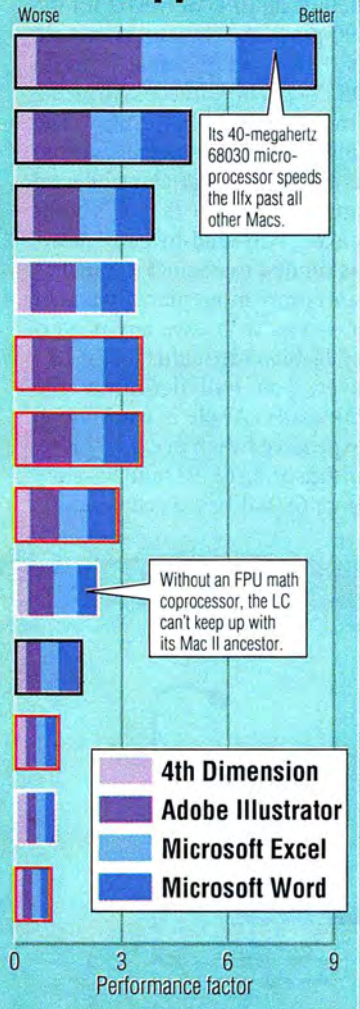


Figure 4: The new Macs — the Classic, the LC, and the IIsi — not only meet the need for low-cost power but they also fill the gaps in the Mac family's performance curve. MacUser Labs tested each Mac from the Plus to the IIfx with four real-world applications, with disk-intensive tasks, and with two common benchmarks that determine the CPU's raw speed. Overall speed is a combination of real-world and disk-intensive tests; every model's overall ranking is maintained throughout the charts as an aid to comparison. Each chart shows the computer's performance factor — how many times faster each Mac performed when compared with a Plus.



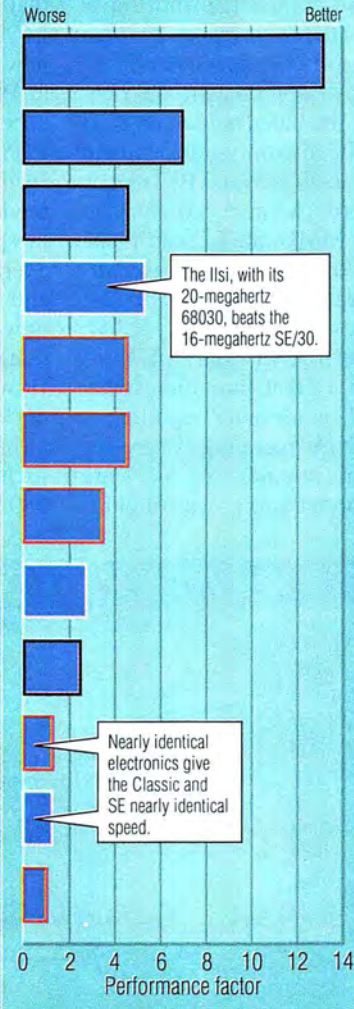
Every Mac runs into the SCSI bottleneck each time it accesses its hard disk. MacUser Labs' DiskBasher! test of hard-disk throughput showed the level of SCSI-port evolution to be the determining factor in disk-intensive performance. We also copied a large file, using the Finder's Duplicate command. Surprisingly, the new IIsi beat out even the powerful IIfx — if only by a hair. Although the IIfx includes sophisticated SCSI DMA (direct-memory access) hardware, the current Mac operating system doesn't take advantage of it. Don't look to System 7.0 to help either — the IIsi should remain the disk-intensive-application champ.

Speed in Real-World Applications



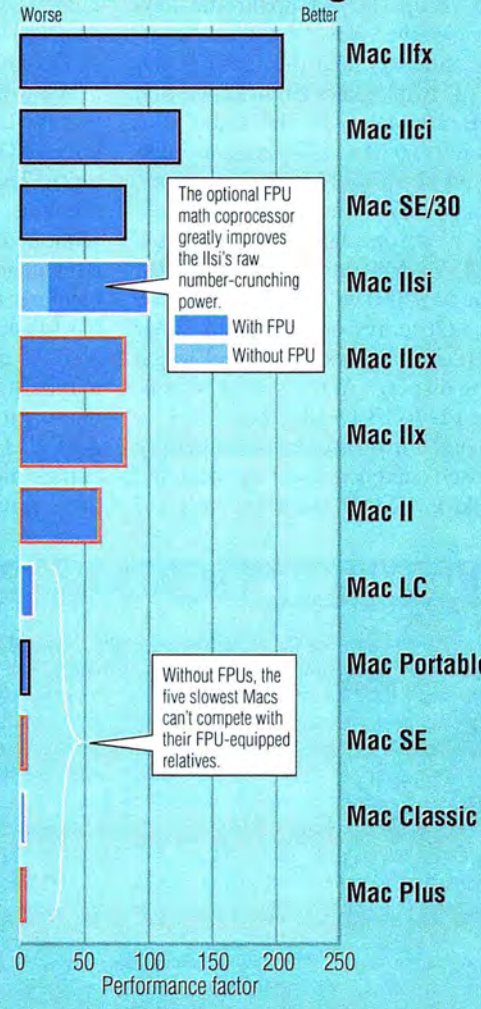
We sorted a large 4th Dimension database and found that CPU speed has little effect on this common database procedure. A faster hard-disk drive would be a better investment than a more powerful Mac. We then previewed a large and complex Adobe Illustrator document, recalculated a mortgage in Microsoft Excel, and performed a global search-and-replace in Microsoft Word. The speed of the IIsi in the Excel and Illustrator tests was limited by its lack of an FPU math coprocessor — we recommend that you add this optional chip for best performance.

Raw Speed – General Use



Raw-speed tests show how fast a Mac can perform pure computational tasks that aren't dependent on applications or disk speed. We used Dhrystones2 (the latest version of the tried-and-true benchmark) to test integer and string operations that mimic real-world computation. The Classic and the SE put in nearly identical performances, because of their nearly identical electronics. The 20-megahertz 68030 microprocessor in the IIsi shot it ahead of the 16-megahertz SE/30 but not ahead of the 25-megahertz IIci and the 40-megahertz IIfx.

Raw Speed – Number Crunching



We found a tremendous increase in the raw speed of number crunching as we climbed the evolutionary ladder — especially with the addition of an FPU. We used the familiar Whetstone test to perform floating-point calculations beyond the basic math of simple spreadsheet setups. The Plus, Classic, SE, and Portable — all 68000-based machines — performed dismally, with the IIsi without an FPU and the LC only marginally better. When an FPU is added to the IIsi, it again joins the big leagues. The Mac IIfx remains the undisputed champ: more than 200 times faster than the lowly Plus.

of either-size SIMMs will bump you up to 4 megabytes or 10 megabytes, respectively.

The LC supports the new 64-dpi 12" RGB Display, the newly revitalized 76-dpi 12" Monochrome Display (see the "New Low-Cost Monitors" sidebar), and the familiar 69-dpi 13" AppleColor High-Resolution RGB Display. On the latter two monitors, 640 x 480 pixels are displayed at up to 16 grays or colors, respectively — a 4-bit *pixel depth*. The new, optional Macintosh LC 512K VRAM (video RAM) SIMM (around $200) will raise the ante to 8 bits (256 grays or colors) on either the 12-inch monochrome or 13-inch color display. Apple's new Macintosh 12" RGB Display beams 512 x 384 pixels in 8-bit color onto a crisply focused screen without the optional VRAM SIMM. With the VRAM SIMM, the LC can display 16-bit color, providing subtle enough shading for all but the most demanding photo-retouching applications. The first 15 bits of 16-bit color provide 32,768 colors; the 16th bit is reserved for the *alpha channel*, which is used by software developers.

We were disappointed to discover that the LC includes neither an FPU nor an MMU (memory-management unit). The lack of an FPU makes numbers crunch more slowly, and without an MMU, the LC can't take advantage of System 7.0's *virtual-memory* feature: the ability to use hard-disk space as temporary RAM. Neither can the LC run A/UX — maybe not a great limitation today but sure to become more important as Apple's UNIX operating system becomes more popular. Not only are these important and powerful chips lacking but the motherboard doesn't even offer empty sockets to enable you to add them later.

It's possible that enterprising third-party vendors will offer add-in cards that include an FPU or MMU for the LC's 96-pin PDS. This slot is a whole new 68020-based PDS that — as do all PDSs — gives you access to all the necessary microprocessor pins. The PDS also has some special wiring, such as a sound line that lets an internal modem send sounds to the LC's built-in speaker. Any add-in card, however, is limited to about 3 x 5 inches and can't draw more than 4 watts of power — you won't see any power-hungry 24-bit-video cards for the LC. However, you will definitely see network cards (Apple is working on an inexpensive Ethernet card — look for it in the spring of '91) and possibly 68030- or 68040-based accelerators.

The Bandwagon

If you're excited about the three new low-cost Macs, imagine how ecstatic developers are. If Apple's expectations of high-volume sales are sound, there will be a lot of money to be made by supplying new software, peripherals, and add-in cards for the new Macs. Third-party developers are releasing a variety of products that either take advantage of new capabilities such as sound or target special needs such as networking, memory expansion, or RAM caching.

For the Classic, Computer Care and Lapis will be jointly marketing a card that includes RAM and an interface for a large-screen monochrome monitor. You will be able to use both the Classic display and that of the add-on monitor simultaneously, and the board will supply an extra megabyte of memory with SIMM sockets for 2 megabytes more — just as Apple's board does. Computer Care will also be offering two additional memory boards. The first (about $150) is a third-party version of the optional Apple memory-expansion board. The second (about $199) is a board that will have additional SIMM sockets for adding a RAM disk.

For the IIsi, PSI Integration is offering a low-cost, flexible alternative to Apple's Macintosh IIsi 030 Direct Slot Adapter Card. Its SE/30 Bus Adaptor card includes a 68030 PDS, a socket for an optional FPU, and a third socket for PSI's $599 Cache-It! — a 64K RAM-cache card. PSI has announced that the Bus Adaptor will list for $99, but the company is thinking of lowering the price to $69.

Many of the new products for the LC and IIsi are based on the new sound capabilities of those machines, but if you want to start digitizing sounds and taking advantage of the new wave of sound software and you aren't planning to buy an LC or a IIci, you'll need a third-party digitizer. Farallon's versatile MacRecorder, which comes bundled with SoundEdit software, is still a good value at $249. If you only want to even the score with LC and IIsi owners, you can opt for Farallon's less expensive Voice Digitizer ($149), which has no audio-input jack or built-in level control.



The unidirectional Desktop Mike from Articulate Systems, coupled with the company's Voice Navigator/SW software, provides the LC and IIsi with voice-recognition capability. The new omnidirectional microphone from Apple can also be used, but the Desktop Mike provides greater precision in noisy environments.

Farallon no longer has the digitizer market to itself. Articulate Systems, the maker of Voice Navigator, recently introduced Voice Link ($269), a voice digitizer with built-in compression and an

In addition, Apple has announced that third parties are working on token-ring and IBM 3270 mainframe-terminal-emulation cards for the LC's PDS. Clearly, manufacturers believe that the LC will become a corporate network workhorse.

Little Big Man

At first glance, the Macintosh IIsi is the hardest new Mac to get excited about — unless you like saving money. The IIsi is ideal for corporate buyers who want to equip their staff with high-powered, expandable color Macs but who can't convince their finance departments to spring for IIci's all around. Although the 20-megahertz IIsi lagged noticeably behind the 25-megahertz IIci in most of our testing, its overall speed was greater than that of the popular 16-megahertz IIcx that it's replacing. Also, it was surprisingly fast in disk-intensive tasks — faster even than a $10,000 IIfx. (The IIfx's much-ballyhooed SCSI DMA feature, designed to speed up disk-intensive tasks, is not yet supported by System software — and don't expect System 7.0 to help.)

The IIsi is essentially a repackaged SE/30 with a 20-megahertz 68030 instead of the 16-megahertz chip, minus the monitor and FPU (although an FPU is optional, unlike with the LC) and including a video port ready to accept a color monitor (see Figure 7). Two configurations are available: 2 megabytes of RAM and a 40-megabyte hard drive ($3,769) or 5 megabytes of RAM and an 80-megabyte hard drive ($4,569). One megabyte of RAM is soldered onto the motherboard, and either four 256K or four 1-megabyte SIMMs are

The $1,000,000 Name

While becoming a $5-billion corporation, Apple earned the right to pat itself on the back, no matter the cost. The new econo-Mac is a case in point — Apple bought the name Classic from Florida-based Modular Computer Systems for a cool million dollars.

The name Classic is also associated with Coca-Cola — the irony being that John Sculley, Apple's president, is the former president of Pepsi-Cola, Coke's archrival in the Cola Wars. We can only assume that Sculley hopes his new Mac Classic will become the choice of a new generation.

Pop culture aside, the term *classic* has for years been used to describe the Mac Plus and the earlier 128K, 512K ("Fat Mac"), and 512Ke. A *real* fanatic, however, considers only the original beige Mac 128K to be the true classic.

— Bruce Mewhinney

accompanying DA that allows direct-to-disk recording (something SoundEdit doesn't do yet).

If you're handy with a soldering iron, you can download plans from Zmac for a do-it-yourself sound-input device that costs about $20 in parts (it's called SID), and you'll also find some simple software for recording and *very* basic voice recognition.

Because Apple has refrained from trying to provide much in the way of user software tools for audio, anybody who's interested in exploring the full capabilities of digitized Mac sound will buy an editing application, such as Farallon's SoundEdit or Articulate Systems' Voice Link software. SoundEdit, which until now has shipped only with MacRecorder hardware, will soon be available separately; the stand-alone software price was undetermined at press time. The price of Voice Link software without the digitizing hardware was also undetermined, but it will be less than $100. For those who are looking for more power, Passport's Sound Apprentice ($295) is a full-featured MIDI-capable editing environment that also supports input from music synthesizers.

Although powerful sound-editing software such as SoundEdit and Sound Apprentice is fun (we haven't yet seen the Voice Link software), these applications probably do more than most business users will need. A new software package from Farallon with broader application is DiskPaper, which lets you print pages from any application to disk for distribution to other users. Those users can then view or print the image without needing the original application. If you've got a sound-capable Mac — that is, an LC or IIsi or any Mac equipped with Farallon's MacRecorder or Articulate Systems' Voice Link — DiskPaper also lets you add voice annotation to the document. Any Mac user can play back the annotation.

Both CE Software and Microsoft have already added annotation capability to their E-mail programs. Adding sound to E-mail messages greatly increases their file size, so adding three-minute symphonic overtures to memos should not be encouraged. QuickMail is more problematic than Microsoft Mail in this respect, because it sends a separate copy of your message to every single addressee over your network — a good way to bring your server to a standstill if each of those messages occupies several hundred kilobytes (CE Software says it's studying this problem). In addition, WordPerfect is planning to include voice-annotation capability in the E-mail module of its WordPerfect Office collection of utilities.

Several major software developers have already started taking steps to add voice annotation to new versions of popular business applications. Ashton-Tate has announced that voice annotation will be included with upcoming versions of its FullWrite word processor and Full Impact spreadsheet program. Claris is showing a prototype for a similar feature in MacWrite II. Others are sure to follow.

Voice recognition, which until now was an exotic technology for most Mac users, will be available to any LC or IIsi owner who gets Voice Navigator/SW — a new, software-only version of Articulate Systems' Voice Navigator II system. (The original Voice Navigator won the *MacUser* 1989 Eddy award for Most Significant Hardware Product.) With this new version, the hardware becomes transparent, although you might want to invest in an Articulate Systems' unidirectional Desktop Mike ($95), which not only looks smarter than Apple's omnidirectional microphone but is also better suited to voice-recognition applications, especially in noisy offices.

Once you've seen how long it takes to move big sound files around on your network, you'll be interested to hear that Asanté has redesigned its SE/30 Ethernet card so it will fit vertically in the IIsi. Buying the new card will save you the $100 that you would otherwise spend for an adapter card, although you'll have to live without an FPU math coprocessor.

— Jim Bradbury

included. The IIsi can also accept 4-megabyte SIMMs, but only 16 of the resulting 17 megabytes can be addressed by the Mac's current operating system. System 7.0 and A/UX, however, can address up to 4 gigabytes (billions of bytes). While you wait for System 7.0, you can use the leftover megabyte as a RAM disk. Apple has also announced 512K and 2-megabyte SIMMs that it will sell in kits of four SIMMs each. These kits will upgrade the IIsi to 3 megabytes or 9 megabytes, respectively (the IIci can also use these new SIMMs). You can use any of your old SIMMs in the IIsi as long as they are rated at 100 nanoseconds or faster.

The IIsi's motherboard is extremely compact, because of a low chip count and the addition of a few new custom chips. A 20-megahertz 68882 FPU is available on either of two optional adapter cards — one that adds an SE/30-style PDS and one that adds a standard NuBus slot. We expect the PDS card to cost about $100 and the NuBus version about $200. The slot on the IIsi's motherboard matches the SE/30 PDS pin for pin and has a generous 15-watt power allocation — more than enough to power the greediest 24-bit-video card. Without the adapter card, however, add-on cards must be very small in order to fit vertically in the chassis. Asanté, one of many developers that were expected to announce products on October 15, has redesigned its Ethernet card to fit vertically in this slot. This $495 card will give you Ethernet and save you the cost of the adapter card — but you'll have to live without an FPU. When either the PDS or the NuBus adapter card is used, add-in cards are held above and parallel to the motherboard, with cable access through a punch-out port at the rear of the IIsi.

The IIsi supports the same three Apple monitors the LC does, plus the crystal-clear 15" Macintosh Portrait Display. All three Apple 12-inch monitors and the 13-inch monitor can display up to 256 colors or gray levels (an 8-bit pixel depth). The IIsi can drive the Apple Portrait Display

Apple-IIe-in-a-Mac

With the October product announcements, Apple is ready to add two more operating systems to the Mac's repertoire. With various software or hardware add-ons, the Mac can run IBM's PC-DOS, the UNIX and X Window systems found on workstations, and even Microsoft Windows 3.0 for PCs. A new emulation board to be released by Apple in March will allow a Mac to run DOS 3.3 and ProDOS 8, respectively the earlier and current Apple IIe operating systems. This is especially important for the school market (kindergarten through 12th grade), where Macs have been too expensive until now and where a large investment has already been made in Apple II software. There's only one catch: The board works only in the Mac LC, not in the low-end Classic.

The entire emulation board contains only eight integrated-circuit chips, including the 6502 CPU, the same processor that powers the Apple IIe. The board can run at two clock speeds (1 megahertz or 2 megahertz), which are switchable in software.



The new Macintosh LC Apple IIe Option Card (center) supports the Apple II joystick (left) and the Apple II 5.25-inch drive (right). The LC's SuperDrive can read Apple IIe 3.5-inch ProDOS disks.

The card has one input with a Y connector that allows the simultaneous hookup of a joystick and a 5.25-inch floppy-disk drive. Accompanying software will allow an Apple II disk to mount on the Mac desktop, so you won't need Apple File Exchange to copy Apple II files to your hard disk. Other software will let you create a ProDOS partition on your Mac hard disk that will mount as a separate volume.

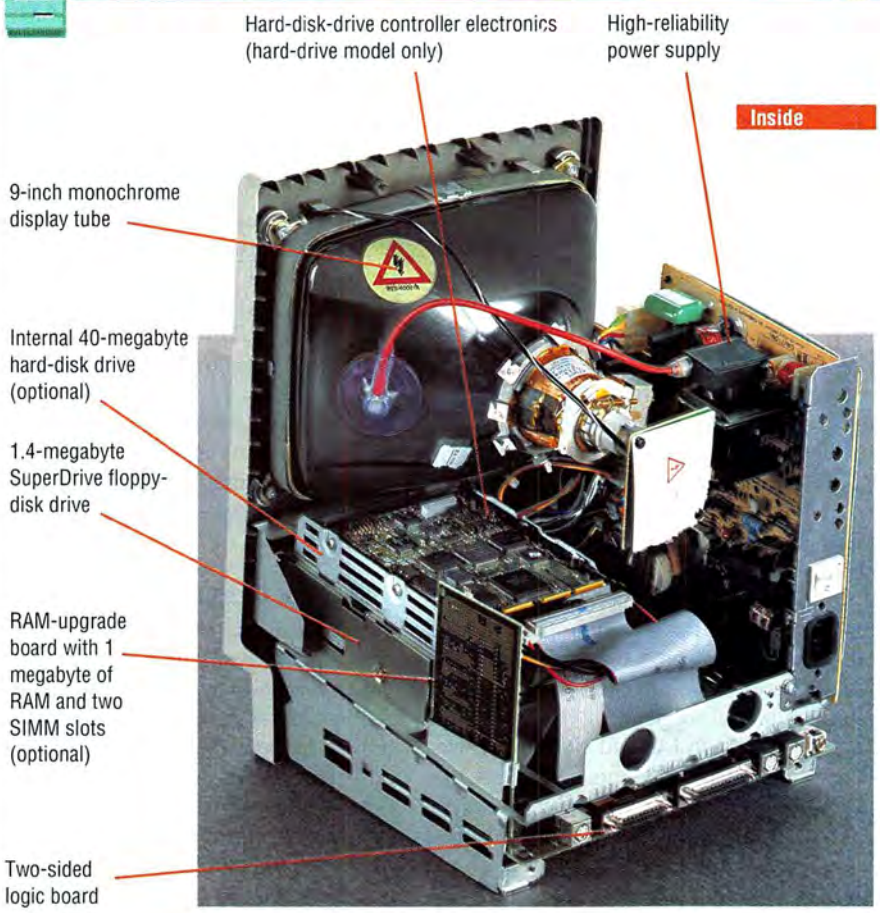
To launch ProDOS, you double-click on an application icon on your Mac desktop. The IIe board takes over your entire screen rather than running in a separate window as do other foreign operating systems. This approach is intentional, so as not to confuse schoolchildren with issues of multiple operating systems and interfaces. A cdev lets you move between the Mac and Apple II environments, and you can quit to the Finder from an Apple II application.

This emulation board will no doubt be compared to IBM's Apple II emulator board, which runs in the IBM PS/2 line of PCs. Not surprisingly, users should find Apple's board easier to use. In order to run Apple II files with IBM's board, users must first launch a utility that converts ProDOS files to PC-DOS files that look like ProDOS to the board. Apple's IIe board for the Mac can run real ProDOS files. Although we haven't tested the new board, we did watch it run the old Apple II game Raster Blaster — a good sign, because games are tough tests of compatibility.

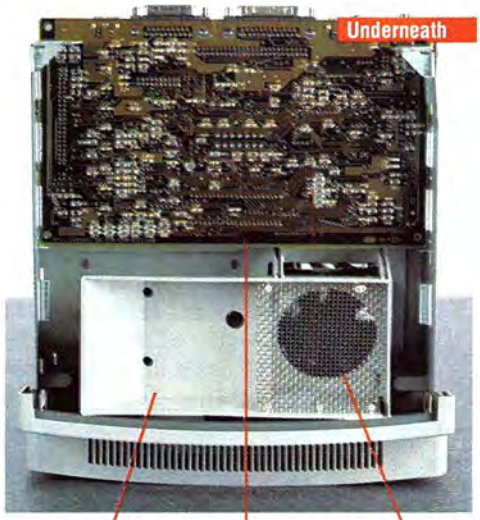
A future release of Apple's board will also handle existing AppleTalk networks with AppleShare file serving, which is used in many schools. Pricing was not available at press time, but Apple indicated that the IIe-emulation board's retail cost would be in line with the LC's low price tag.

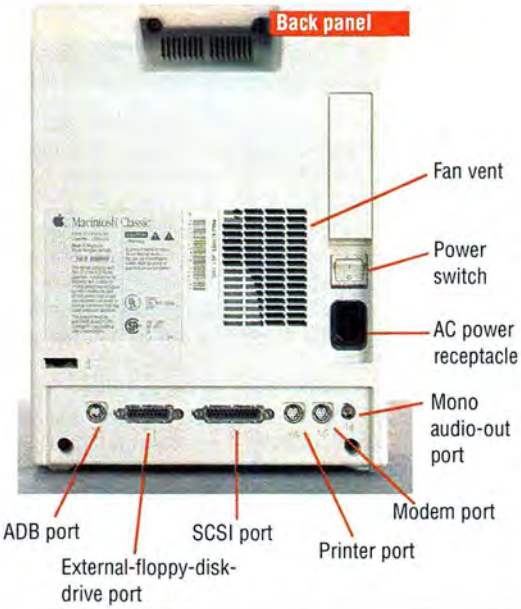
— John Rizzo

Figure 5: Inside the Macintosh Classic



Although the Mac Classic is positioned as the replacement for both the Mac Plus and the SE, its sole direct ancestor is the SE. The inside of the Classic is not radically different from that of the SE, except that the Classic has no PDS and no RAM SIMM slots on its logic board. Instead, RAM upgrades involve adding a RAM-upgrade card that contains 1 megabyte of RAM and two SIMM slots. The Classic's logic board is half the size of the SE's — even though they both contain essentially the same parts — because the Classic's parts are smaller and are mounted on both sides of the logic board. The smaller board allows for a bottom-mounted fan, a screen, and an air scoop.





at up to 16 levels of gray (4 bits). Unlike the LC, the IIsi has no optional VRAM SIMM that allows it to display 32,768 colors (16 bits) on the new 12" RGB Display — you'll have to use the PDS or NuBus option with a third-party video card to step up to 16- or 24-bit color. Because Apple provides only one slot for expansion, you're stuck with Apple displays if you want to add a nonvideo expansion card for Ethernet, SCSI acceleration, or other uses.

Cheap Chips

It's not just marketing savvy that makes Apple offer these three new machines at such reasonable prices. There's a lot of cost-cutting engineering know-how inside their sleek cases. In addition to the reduction in the number of expansion slots, less apparent changes have dramatically reduced production costs. For example, because no screws are used, the Mac LC and IIsi can be assembled from their snap-in subcomponents in less than 90 seconds. But the biggest part of the economy story is in the logic boards and the chips that they contain.

The Classic has no new chips (read our lips). Every part on the SE logic board is on the Classic board. The big difference is that parts on the SE board are traditional, through-hole parts — the little "feet" on each chip, called *leads*, must be inserted through holes drilled into each board. The new machines take a giant step beyond this slow, expensive process by using SMD (surface-mounted device) technology.

SMD parts (also used on the IIcx, IIci, and IIfx) don't have leads but are soldered onto the board's surface. Because you don't have to drill holes in the boards, SMD boards are cheaper to build. The absence of leads lets SMD chips (and other electronic parts) be very small, down to a tenth of an inch in size, and they can be used on both sides of a circuit board. All this results in smaller circuit boards. And smaller circuit boards mean cheaper circuit boards. SMD parts are also cheaper to put onto a board. You need people to insert the leads of a through-hole part into the little holes on the board, but SMD parts can be attached to a board by industrial robots.

Also, the LC and IIsi have fewer chips than do previous Macs. Apple achieved this by combining older custom chips into single new chips. For example, the LC and the IIsi have a new chip that combines the SCSI controller and the serial-port controller, which were previously on separate chips. There is also a chip that Apple refers to as the Egret, which combines the parameter RAM, the ADB circuitry, and the real-time clock, among other things. This combining of chips not only saves Apple money but it also provides peace of mind for Mac users, because more integration — fewer chips — generally means better reliability.

The LC's logic board uses just 27 chips (not including resistors and capacitors). Compare this silicon frugality with IBM's use of almost 100 chips on its PS/2 55sx — and Big Blue's machine doesn't contain onboard video, networking, sound, or a SCSI interface! If you're still not impressed, remember: The Mac LC is $1,500 *cheaper* than the 55sx. Cuter too.

Systemic Changes

Hidden in all the excitement about new hardware is Apple's release of new System software, version 6.0.6. All System-software revisions since 6.0.2 have been billed as simple support releases for new Macs. System 6.0.6's purpose isn't all that different, but the number of changes required to support the three new Macs is extensive.

Minor changes in 6.0.6 include a revision of Font/DA Mover, version 3.9, which claims to fix several previously undiscovered bugs as well as incompatibilities with MultiFinder. The upgraded LaserWriter driver, 6.0.2, now accommodates printing envelopes on the Apple Personal LaserWriter (you feed them in on the left edge rather than in the center of the paper tray, as required by printers in the LaserWriter II series), and the old LaserWriter SC driver has been replaced by a new driver for the Personal LaserWriter SC.

The most significant change is the inclusion of a substantially upgraded version of the Sound Input Manager, which was redesigned for System 7.0. It is included in 6.0.6 to support the sound capabilities of the Macintosh LC and IIsi. The most obvious change for users is that the Sound

Apple Versus Apple

Why hasn't Apple provided CD-quality sound-recording capability in its new Macs? The NeXT machine supports full 16-bit, 44-kilohertz sound — high-quality audio matched by your CD player. Apple, however, limits its LC and IIsi to 8-bit sound and provides a cdev that samples at a paltry 22 kilohertz. Why the conservative approach? The answer might be found in the courtroom, not in the developer's lab.

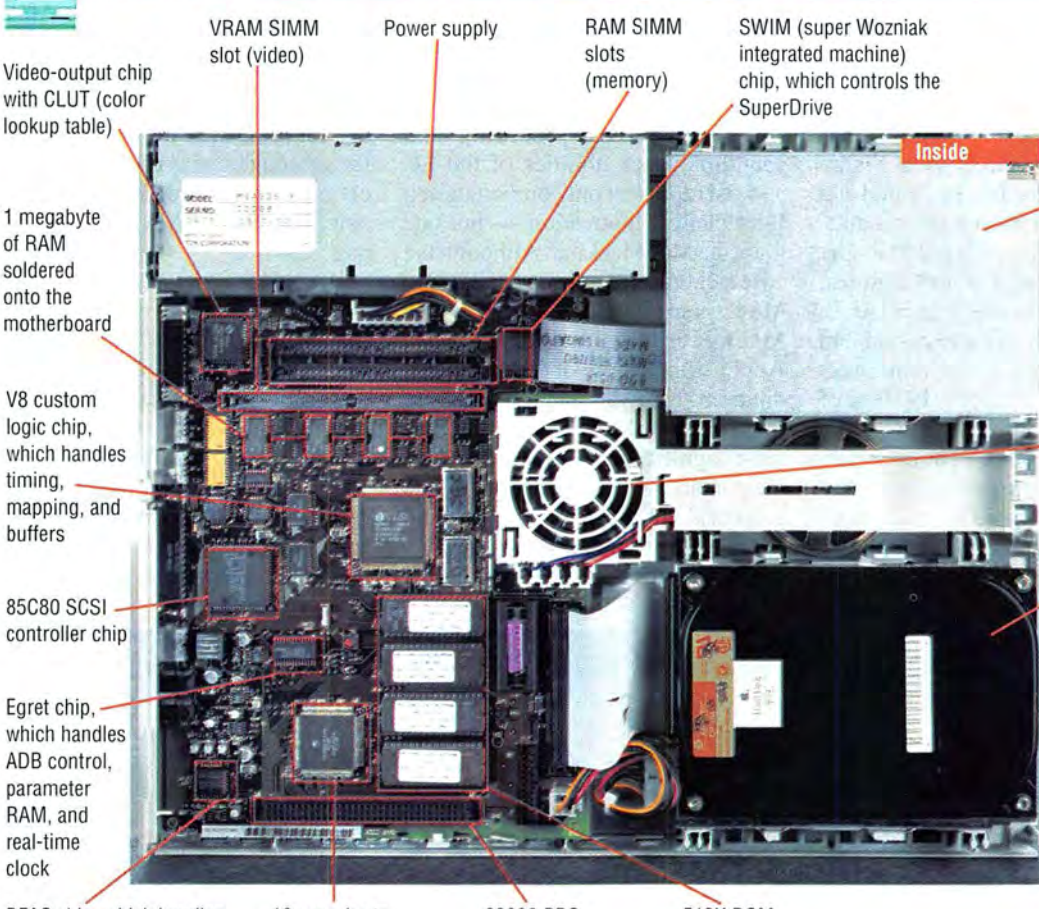
Way back in 1981, up-and-coming Apple *Computer* signed an agreement with then-moribund Apple *Corps*, the Beatles' record company, promising not to market products "for the recording or reproduction of sound or video or a component part of such a system." Last year, after being tipped off by former Beatle George Harrison, Apple Corps initiated legal action, charging that Apple Computer had violated this agreement when it introduced the Apple MIDI interface and other audio technologies.

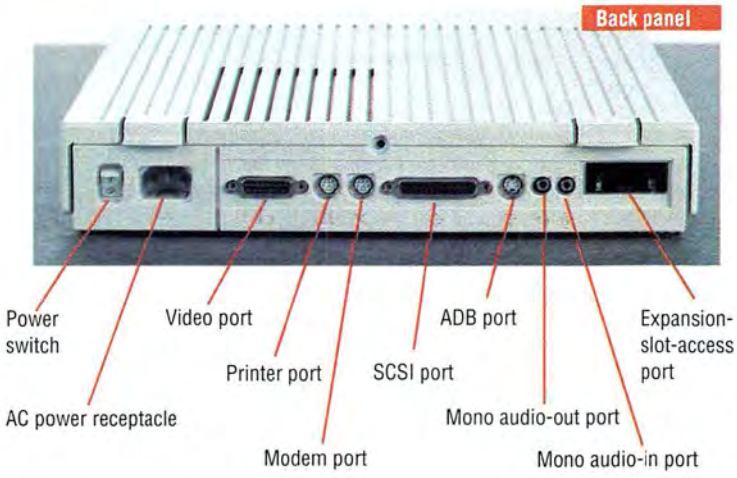
Believing that the best defense is a good offense, Apple Computer sued to have Apple Corps' trademark revoked in West Germany, Japan, Sweden, and a few other countries. A British court ruled that Apple Corps was protected from such actions.

At press time, the dispute between the two Apples was still unsettled, with the trial scheduled to begin in late 1990. Regardless of how the lawsuit turns out, onlookers say that it has cast a pall over music and sound development at Apple — and may have kept CD-quality sound out of the new CPUs.

— Jim Bradbury

Figure 6: Inside the Macintosh LC





The color-capable Mac LC is the most innovative of the three new Macs. It uses only three new multifunction chips — the V8, Egret, and DFAC — to perform the functions of many older, less versatile chips. Like its distant cousin, the discontinued Mac II, the LC is powered by a 16-megahertz 68020 microprocessor. Unlike the Mac II, the LC includes neither an FPU math coprocessor nor a socket for the PMMU necessary for A/UX and the virtual-memory feature of System 7.0. The LC includes a new 68020 PDS that is not compatible with similar slots in other Macs (Apple and third-party vendors have already announced compatible add-in cards, though). An optional VRAM increases the number of colors the LC can display. A special education-market configuration of the LC will be available that replaces the hard-disk drive with a second floppy drive.

cdev now lets them select a sound-input device (usually the LC's or the IIsi's microphone) as well as set any of the device's options. Once you've selected an input device, clicking on the Add button lets you record a sound directly to disk, using familiar tape-recorder-style controls (see Figure 8). You can then name the sound and use it — as a system beep, for example.

The updated Sound Input Manager offers a broad range of new features, the most revolutionary being MACE: Macintosh Audio Compression and Expansion. MACE can compress sound data by a ratio of 3:1 (300K of sound data compresses into 100K) without loss of fidelity, or by a ratio of 6:1 by cutting the sampling frequency in half (more on this later). Compressed sound can be played back in real time on *any* Mac from the Plus to the IIfx — as long as the playback Mac is running System 6.0.6 or its System has been upgraded to include MACE.

Introducing Sound

The new sound-recording and sound-playback abilities of the LC and IIsi represent only one small step for technical innovation — but one giant leap for Mackind. Although the core technology has been available to Mac users since Farallon's MacRecorder shipped in 1988, Apple's inclusion of 8-bit sound-digitizing hardware and software with these two new Macs is potentially the most significant interface development since the introduction of the graphical interface on the original 128K Mac in January 1984.

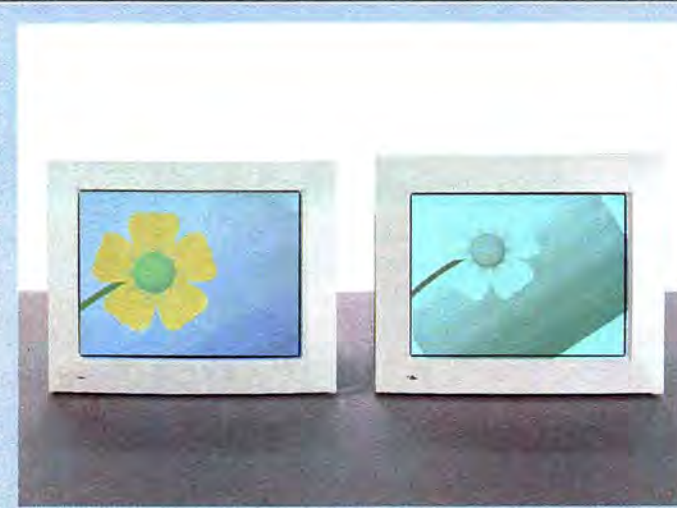
If you're familiar with Farallon's MacRecorder or Articulate Systems' Voice Link, then you already understand much of what Apple has done. An A/D (analog-to-digital) chip on the motherboard of the LC and IIsi digitizes sounds in available RAM and lets you store the sounds to disk for subsequent playback and modification (for a more detailed discussion, see "Sound Advice," May '90, page 284).

How does a sound get converted from an analog wave into a digital sequence of numbers? The LC or IIsi *samples* the wave — instantaneously records it — at regular intervals and then creates a digital map of the wave's shape (see the "How Sound Works" sidebar). This map — which carries information that describes the sound that produced it — can later be used to reconstruct the original sound.

New Low-Cost Monitors

October 15 was not only a great day for CPUs — it also saw the introduction of a new color monitor and the revitalization of an old monochrome one. First, the Macintosh LC, Apple's lowest-cost color unit, needed a companion low-cost color display. Although the LC supports the AppleColor High-Resolution Monitor, few of us on a tight budget want to pay $999 for Apple's finest. The new $599 12" Macintosh RGB Display is a solid product that can outperform many similarly priced monitors. Most high-end users will still opt for the AppleColor, with its caviarlike price, but the rest of us no longer have to settle for cheap, low-performance third-party options.

Here are the facts: The 12" Macintosh RGB Display is not a Trinitron. It is, however, a monitor with a fine-pitch, .28mm shadow-mask tube that looks better than any other shadow-mask low-price monitors we've seen. And it lists for $400 less than the AppleColor does. As for screen resolution, it's a 64-dpi display that shows 512 x 384 pixels; that's 12 percent more than the Classic screen but 36 percent less than the AppleColor has. The display has a 60-hertz refresh rate, which may cause eyestrain for those who are sensitive to screen flicker. The basic LC and the IIsi support this display at 8 bits (256 colors). When it contains the optional Macintosh LC 512K VRAM SIMM, the LC can show 16-bit true color (32,768 colors, with the 16th bit reserved).

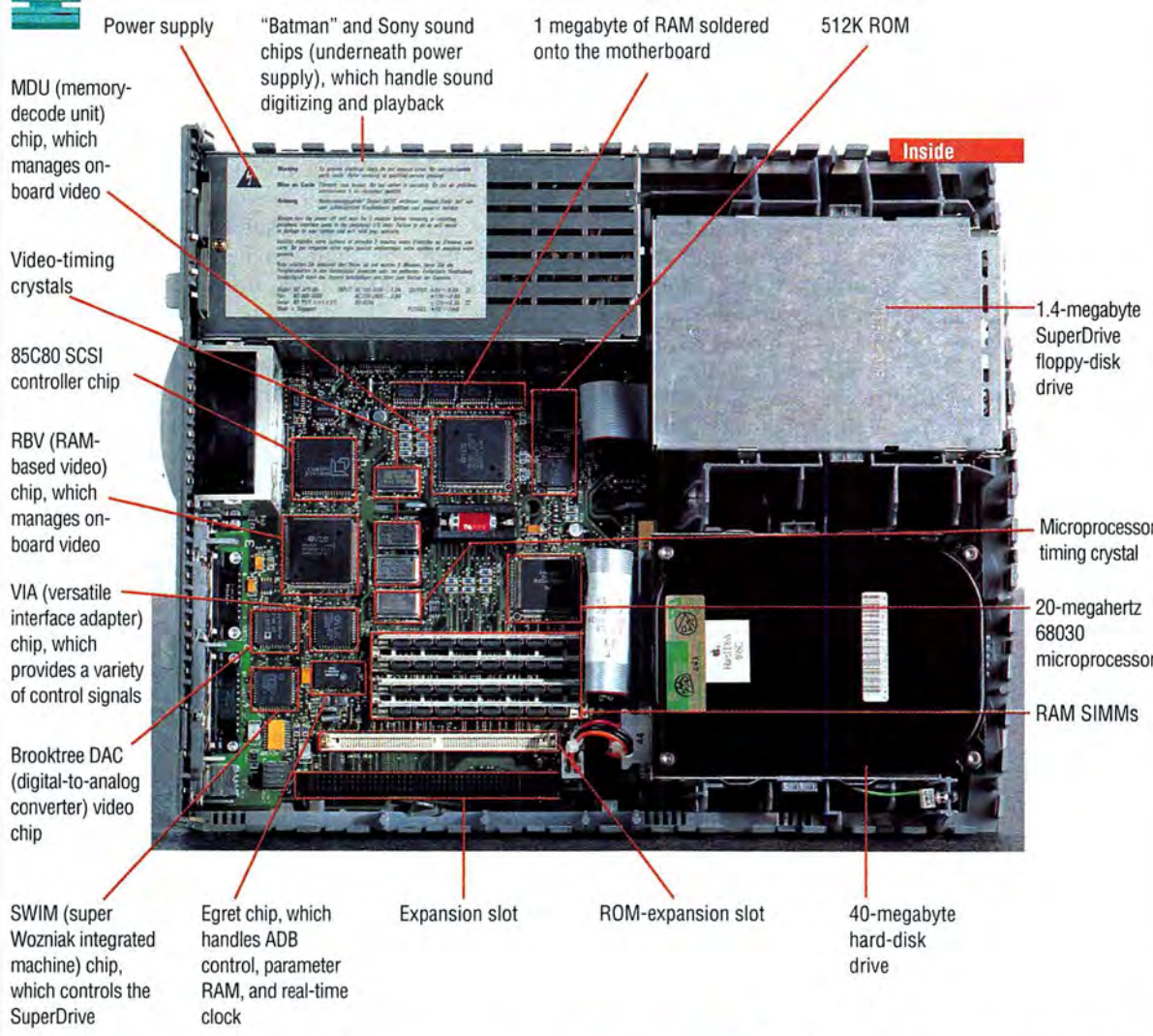


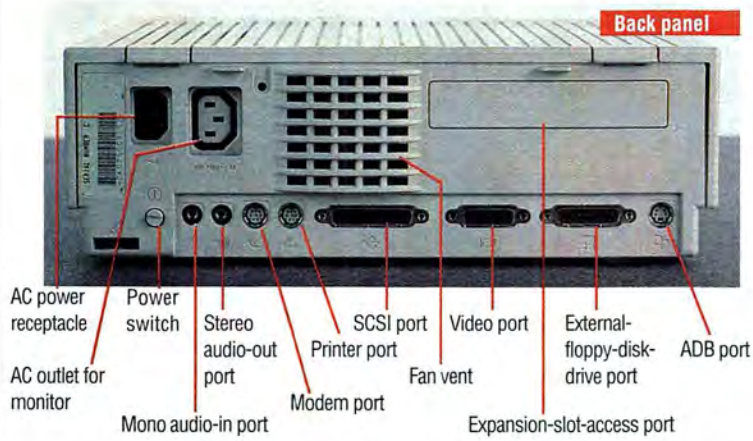
Despite their equal screen sizes, the new 64-dpi Macintosh 12" RGB Display (left) displays significantly less information than does the new 76-dpi Macintosh 12" Monochrome Display (right).

Apple's new Macintosh 12" Monochrome Display does not have an etched screen as did the Macintosh High-Resolution Monochrome Monitor it replaces, so it's much sharper and has higher contrast. The previous model's etched screen drastically impaired contrast and sharpness, although its antiglare properties were superior (see "A Study in Black and White," April '90, page 182, for a full discussion of monitor matters). The new display is priced the same at $399 and still shows 640 x 480 resolution with a flicker-free screen-refresh rate of 67 hertz. The pixel density has been upped to 76 dpi from 74 dpi, so things display a bit smaller than they did on the earlier unit. On the Macintosh IIsi and IIci, the display shows 8 bits (256 grays); on the LC, it shows 4 bits (16 grays), or 8 bits (256 grays) with the optional VRAM SIMM.

— Jeff Pittelkau

Figure 7: Inside the Macintosh IIsi





The Mac IIsi is a low-cost replacement for the just-discontinued IIcx. Its electronics are similar to those of the SE/30 but cost significantly less. Like the LC, the IIsi can be disassembled and reassembled in minutes: No screws are used to hold together the major components, which all snap into place. Into the expansion slot, you can place one of two optional adapter cards, one with a NuBus slot or one with an SE/30 PDS — both cards include a 68882 FPU math coprocessor. One megabyte of RAM is soldered onto the motherboard, and four RAM SIMM slots permit expansion to 17 megabytes of RAM. A ROM-expansion slot is included for future ROM upgrades.

The more frequently you sample the wave, the more accurate that reconstruction will be — but the larger your sound file will be.

RAM-based recording limits the length of recordings to a few minutes, even if you have lots of RAM and record at low-quality settings. Hard-disk recording, which is not yet supported by software from Apple or Farallon, lets you record for longer and at higher resolutions. The best-known example of hard-disk recording is Digidesign's Audiomedia board (see review, October '90, page 55), which lets you record CD-quality audio at a cost of 10 megabytes per minute. Articulate Systems' Voice Link, a voice digitizer with built-in compression, includes a DA that also allows recording direct to disk

In the audiophile world, the sampling rates that Apple offers in the new Sound cdev are far from the "CD quality" standard of 16 bits of information sampled at 44 kilohertz (44,000 times per second) (see the "Apple Versus Apple" sidebar). High-quality Macintosh audio options such as the Audiomedia board are significant for specific users, much as 16-million-color capabilities are significant for specific users. These high-end options aren't really necessary for the applications, such as voice messaging and file annotation, that Apple is hoping to see take hold in the general Mac-using public. For example, even though the telephone is a low-quality sound device, you can still recognize voices and understand both what they're saying and how they feel about saying it. You don't need to have the clarity of the latest Pavarotti CD to convey a message with a voice-mail system. Apple hasn't shut the door on Pavarotti, though — it has provided System-level software tools that can record at a full 44 kilohertz (although only at 8-bit resolution). The new Sound Input Manager's capabilities will give developers plenty of ways to exploit the new world of sound.

Sound Software

When the original Sound Input Manager debuted with the Mac II, the practical result for most people was the ability to change their beep sound to Monkey, Boing, or Clink-Klank. The new, improved Sound Input Manager bears about as much resemblance to that rudimentary beginning as a IIfx does to the original 128K Mac. With appropriate software, users can now record and play multichannel sampled sounds from memory or from disk — you can finally expect to hear some stereo output from Macs with stereo-output jacks (the IIsi, SE/30, IIci, and IIfx),

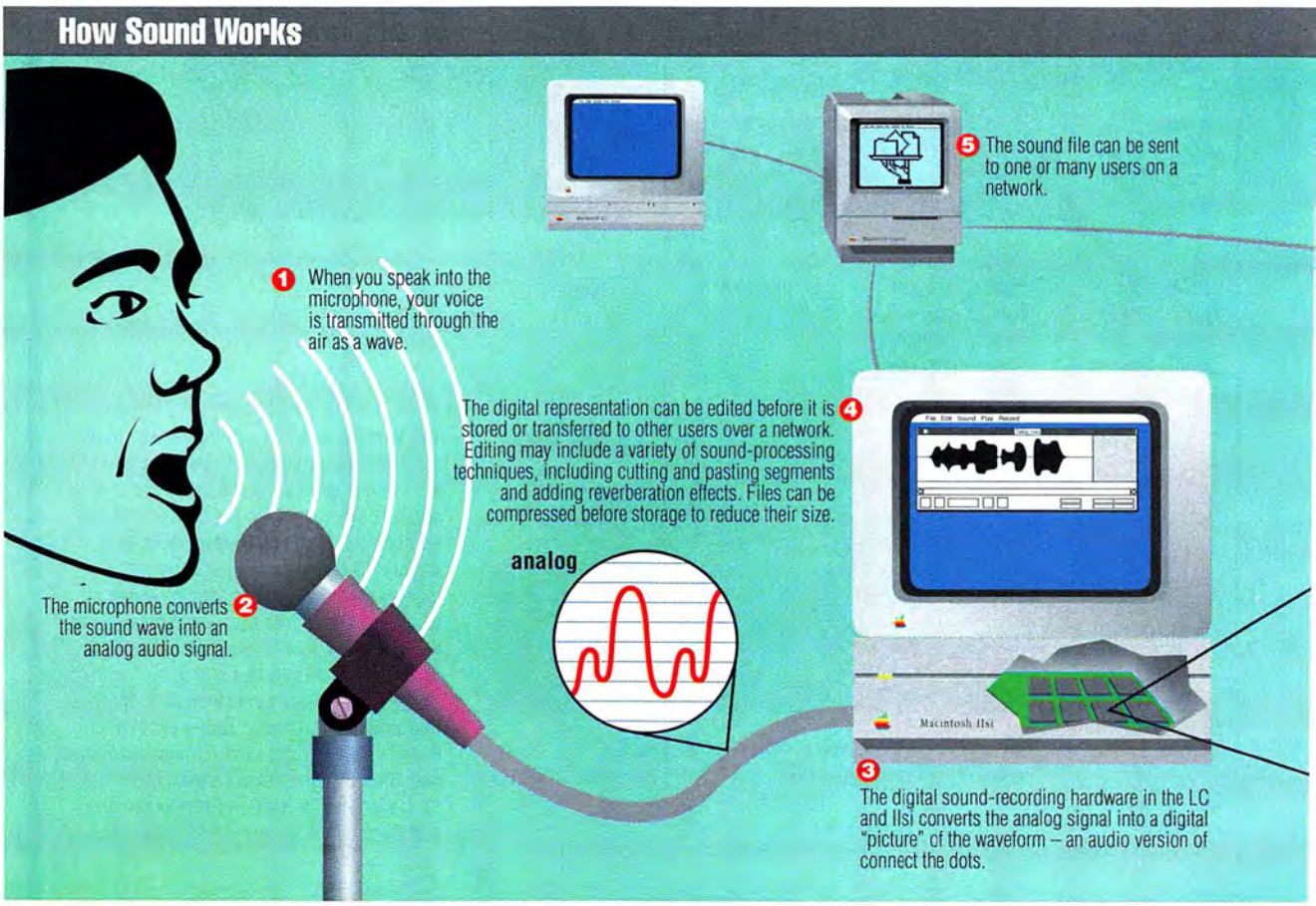
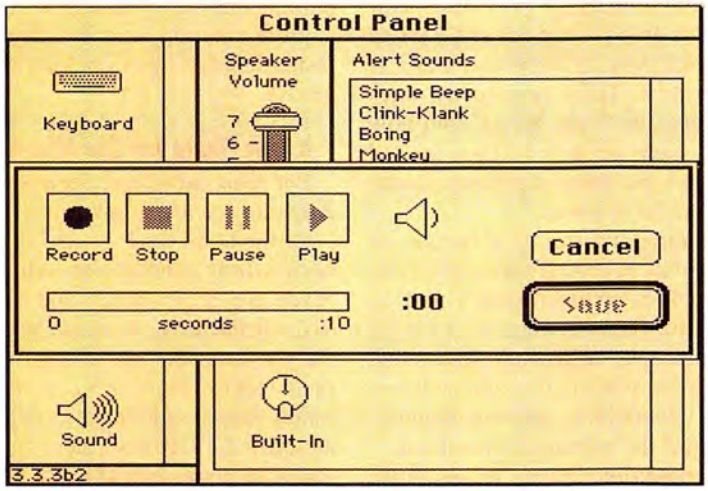
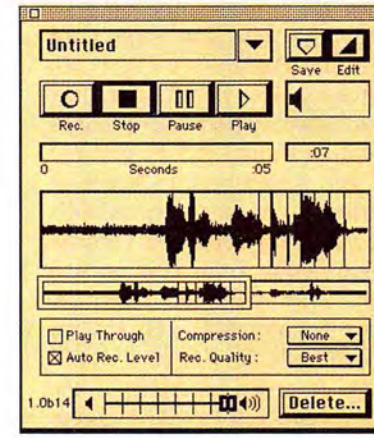


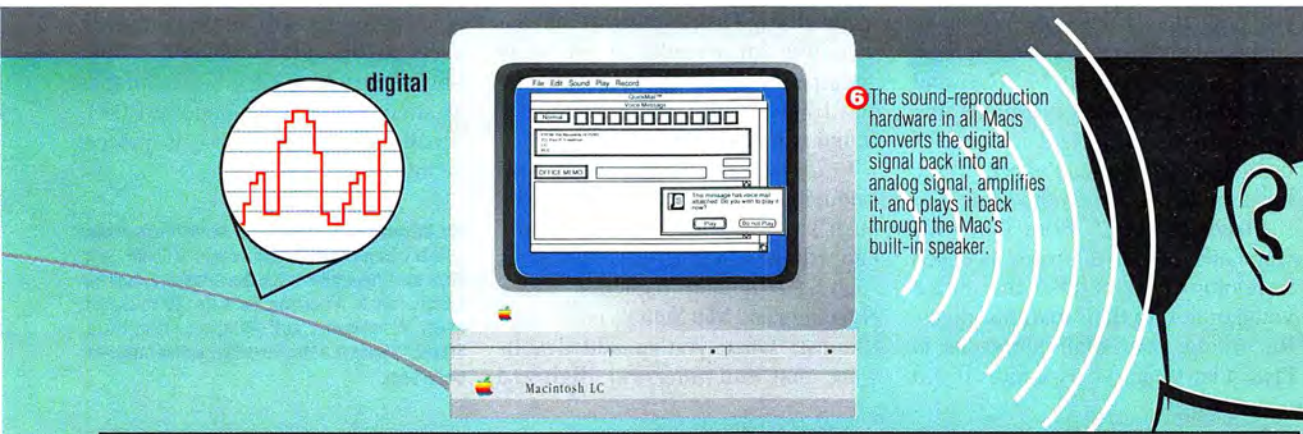
Figure 8: Sound Software

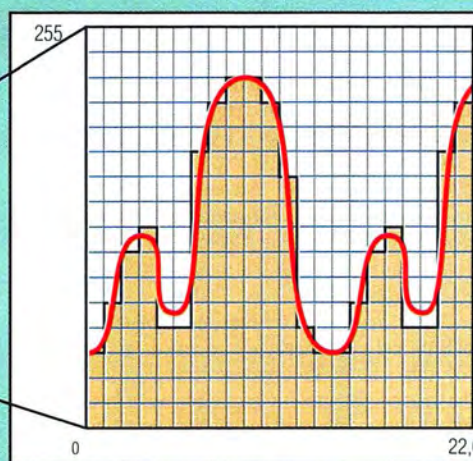


Although Apple includes sophisticated sound hardware with the new LC and IIsi, the only user software it provides is the familiar Sound cdev — a System feature since the Mac II's debut. The only difference is that you can now add your own beep sounds.



The closest that Apple comes to providing a real user sound tool is the Audio Palette, which comes with HyperCard 2.0. It lets you sample and edit sounds at different frequencies. You can also compress sound files when you're saving them to disk.





The higher the resolution, or quality, of the digitization, the more accurate is the representation of the original sound wave. The resolution of the sound is defined as a grid in which the vertical measurement is the bit depth of the sample and the horizontal measurement is its frequency. The LC and IIsi can record at a depth of 8 bits (256 levels) and at a frequency as high as 44 kilohertz (44,000 times per second). However, software provided by Apple is limited to a frequency of 22 kilohertz; CD-quality audio is 16 bits deep at a frequency of 44 kilohertz.

Compression	1 sec	2 sec	5 sec	10 sec	60 sec
none	22K	44K	110K	220K	1.32 MB
3:1	7.35K	14.65K	36.65K	73.35K	440K
6:1	3.675K	7.325K	18.325K	36.675K	220K

Apple's new MACE (Macintosh Audio Compression and Expansion) protocol lets developers build sound compression into their applications. MACE can save both disk space and network transmission time by compressing large sound files.

provided developers write the necessary applications.

While you wait for this new software to appear, check out HyperCard 2.0's Audio Palette (see Figure 8). This free tool lets you digitize, play back, and do simple editing of sounds from within HyperCard. HyperCard users who remember the hassle of converting to and from HyperCard's native sound format needn't worry. All Mac sounds from now on will comply with AIFF (Audio Interchange File Format). Old HyperCard sounds can still play, but new sounds must be recorded in AIFF. If the Audio Palette doesn't meet your needs and you can't wait for the next generation of sound software, check out Farallon's SoundEdit.

Whether users will attach more than novelty value to sound input is uncertain. Software publishers, on the other hand, have already shown interest in exploiting the new technology. After all, now that Microsoft Windows claims to have brought a true graphical user interface to the IBM PC, sound could become a key distinguishing feature of the Mac. Here are some of the initial uses you can expect to see for digitized sound on the Mac:

Electronic mail. Both CE Software and Microsoft have licensed technology from Farallon that adds a voice option to their mail packages. Recording your mail messages is faster than typing — especially if you don't touch-type. A less obvious advantage is the emotional shading that speaking a message provides — for most people it's far easier to *sound* sarcastic, wry, or humorous than it is to *write* it. Think how many ways you can say "Way to go" and how many more words would be required to make the same statement unambiguous in writing.

Sending and storing messages as voice mail is less efficient, however. Sound files get big in a hurry, and the better the sound quality or the longer the message, the faster they grow and the slower your mail system will run. Still, it would be a mistake to underestimate the appeal of voice mail.

Annotation. Expect to see voice annotation as a common feature of such bread-and-butter applications as word processors and spreadsheet programs (it's already a standard feature of NeXT software). In the meantime, products such as Farallon's forthcoming DiskPaper will make it possible for people to annotate documents from applications that don't have a built-in provision for sound annotations.

Voice recognition. Apple isn't introducing voice recognition just yet, but it's a logical next step. It's already happening with third-party products such as Articulate Systems' Voice Navigator and MacSema's new Voice Express. Once you've added software that can *interpret* digitized sounds — especially the human voice — the Mac interface gains an entirely new dimension. Speaking commands is more natural, more intuitive, and faster than typing or clicking with a mouse.

A New World You Can Afford

For years users have been begging Apple to release a low-priced Mac. Now there are three — and they've been worth waiting for. All three Macs are great values and should strike fear into the hearts of the IBM PC-clone makers whose only selling point is price. No longer can a corporation justify saddling its staff with antiquated DOS machines — Windows 3.0 notwithstanding — when a few dollars more can provide color, sound, SCSI, plug-and-play simplicity, crisp displays, cross-application interface consistency, and the interapplication-communication promise of the upcoming System 7.0. And no longer will home-computer users be forced to cross the Big Blue line, when a Mac Classic is available at street prices well under $1,000. Small — as in price — is indeed beautiful.

Rik Myslewski is a *MacUser* senior editor who couldn't have written this report without Tony Bojorquez, Henry Bortman, Jim Bradbury, Andrew Eisner, Paul R. Freedman, Russ Ito, Steve Lipson, Bruce Mewhinney, Jeff Pittelkau, John Rizzo, Stephan Somogyi, a Mac Portable, and his father-in-law's boat.

The Bottom Line

For years we hoped for a low-cost Mac, and now Apple delivers three. Not only that, but it throws in a whole new technology — built-in digital sound recording — two new monitors, and a cluster of new add-in option cards. In our opinion, the wait was worth it — each new Mac is a great value.

The **Macintosh Classic** ($999 with 1 megabyte of RAM and a 1.4-megabyte SuperDrive, $1,499 with 2 megabytes of RAM and a 40-megabyte hard-disk drive) is a repackaged SE at a significant savings. In fact, you could buy *two* Mac Classics, each with 2 megabytes of RAM and a 40-megabyte hard drive, for the price of *one* similarly configured SE. That is, if Apple would sell you an SE — it, along with the venerable Plus and popular IIcx, has been retired. The Classic is perfect for first-time buyers or anyone who has a Mac at the office and hates to stay late to finish that never-ending report. IBM PC-clone makers should start looking for another line of work.

The **Macintosh LC** ($2,499) is the most interesting of the new Macs. In its low-profile case are 2 megabytes of RAM, a 68020 microprocessor (as in the Mac II), and a 1-inch-high 40-megabyte hard-disk drive. Apple offers a new 12-inch 64-dpi color monitor for the LC, along with an add-in card that emulates the Apple IIe (complete with joystick and 5.25-inch floppy-disk-drive ports) and a soon-to-be-released Ethernet card. Put it all together, and you get a fully equipped color Mac in the low $3,000 range. Both business and education users will love this one.

The final new kid on the block is the **Macintosh IIsi** ($3,769 with 2 megabytes of RAM and a 40-megabyte hard-disk drive, $4,569 for 5 megabytes of RAM and an 80-megabyte hard-disk drive). This successor to the IIcx outperforms its ancestor and costs $1,600 less. Considering that the IIcx was the most popular Mac model, corporate buyers will be lining up to buy IIsi's by the officeful.

Table 1: The New Mac Family

	Pros	Cons	Ideal Users
Classic 	• Least expensive. • Built-in monitor. • Compact package. • New power supply.	• No FPU or memory-management chip. • Small monochrome display. • No built-in sound input.	• This new no-frills Mac is perfect for first-time buyers or home-computer users who don't need color or speedy performance.
Portable 	• Long battery life. • Good display contrast. • Sturdy carrying case. • Fast 68000 microprocessor.	• Expensive. • Screen is not backlit. • Heavy. • No FPU or memory-management chip. • No built-in sound input.	• Consultants or business travelers will appreciate the battery operation and full Mac functionality of this surprisingly speedy machine.
LC 	• Low-cost color. • Lightweight and compact. • IIe-emulation-card option. • Sound input. • On-board video.	• No 24-bit color. • Limited expansion. • No FPU or memory-management chip.	• This versatile low-cost color Mac should be on the desk of every office worker, student, or educator who doesn't require top-speed performance.
IIsi 	• Good price/performance ratio. • SE/30 or NuBus expansion. • On-board video. • Sound input.	• FPU is an option. • Limited expansion. • No separate video RAM.	• The IIsi should take the corporate world by storm — it's the ideal multipurpose business Mac.
SE/30 	• Built-in monitor. • Color ROMs. • Compact and transportable. • Includes FPU.	• Small monochrome display. • Limited expansion. • No built-in sound input.	• This powerful compact Mac is ideal for number-crunching accountants or others who need power but not color. It's also the perfect network server.
IIci 	• Three NuBus slots. • On-board video. • Cache-card slot. • Includes FPU.	• Expensive. • No built-in sound input.	• For corporate power users, database developers, or the average DTP shop, the IIci is all the Mac they'll ever need.
IIfx 	• Fastest Mac. • Six NuBus slots. • SCSI DMA capability. • Built-in cache. • Includes FPU.	• Very expensive. • Large footprint. • SCSI DMA not supported by System software. • No built-in sound input. • No on-board video.	• The blazing performance of the IIfx is best appreciated by graphic artists, high-end DTP shops, and engineers.

Table 2: Features of the New Mac Family

● = yes ○ = no	 Mac Classic	 Mac Portable	 Mac LC
List price: RAM, disk drive (megabytes)	$999: 1 MB, SuperDrive $1,499: 2 MB, 40 MB	$4,799: 1 MB, SuperDrive $5,499: 1 MB, 40 MB	$2,499: 2 MB, 40MB
CPU			
Microprocessor	MC68000	MC68HC000	MC68020
Floating-point unit (FPU)	none	none	none
Microprocessor clock speed (megahertz)	8 MHz	16 MHz	16 MHz
RAM on motherboard (megabytes)	1 MB	1 MB	2 MB
SIMM slots	2†	1§	2
Maximum RAM with 256K SIMMs	2.5 MB	NA	NA
Maximum RAM with 512K SIMMs◊	NA	NA	NA
Maximum RAM with 1-megabyte SIMMs	4 MB	NA	4 MB
Maximum RAM with 2-megabyte SIMMs◊	NA	NA	NA
Maximum RAM with 4-megabyte SIMMs	NA	NA	10 MB
ROM mounting method	soldered	soldered	socketed
Memory-management unit (MMU)	none	none	none
Internal video support (bits per pixel)			
9-inch internal CRT (512 x 342 pixels)	1	NA	NA
9.8-inch internal flat-panel (640 x 400 pixels)	NA	1	NA
12-inch monochrome (640 x 480 pixels)	NA	NA	1, 2, 4, 8††
12-inch RGB (512 x 384 pixels)	NA	NA	1, 2, 4, 8, 16††
13-inch RGB (640 x 480 pixels)	NA	NA	1, 2, 4, 8††
15-inch portrait (640 x 870 pixels)	NA	NA	NA
Ports			
ADB	single	single	single
Audio out	mono	mono	mono
Audio in (mono)§§	○	○	●
Modem	●	●	●
Video	○	◊◊	●
SCSI	●	●	●
Printer	●	●	●
External floppy drive	●	●	○
Slots			
Processor direct	○	●	●
Cache card	○	○	○
NuBus	○	○	○
Other			
Keyboard included	●	●	●
A/UX-capable	○	○	○
Supports virtual memory	○	○	○
Size (H x W x D, in.)	13.2 x 9.7 x 11.2	2 to 4 x 15.2 x 13.8	3 x 12.2 x 15
Weight	16 to 17.1 lb	14 to 17 lb	8.8 lb

*The optional IIsi NuBus and 030 Adapter Cards include an MC68882 floating-point unit.

†Two SIMM sockets and an additional 1 megabyte of RAM are included in the 2-megabyte Mac Classic configuration.

§The Portable uses static-RAM cards instead of SIMMs.

	Mac IIsi	Mac SE/30	Mac IIci	Mac IIfx
	$3,769: 2 MB, 40 MB $4,569: 5 MB, 80 MB	$3,869: 1 MB, SuperDrive $4,369: 1 MB, 40 MB $5,569: 4 MB, 80 MB	$5,969: 4 MB, SuperDrive $6,669: 4 MB, 80 MB	$8,969: 4 MB, SuperDrive $9,869: 4 MB, 80 MB $10,969: 4 MB, 160 MB
	MC68030	MC68030	MC68030	MC68030
	MC68882*	MC68882	MC68882	MC68882
	20 MHz	16 MHz	25 MHz	40 MHz
	1 MB	none	none	none
	4	8	8	8
	2 MB	2 MB	2 MB	NA
	3 MB	NA	4 MB	NA
	5 MB	8 MB	8 MB	8 MB
	9 MB	NA	16 MB	NA
	17 MB**	32 MB**	32 MB**	32 MB**
	SIMM	SIMM	SIMM	SIMM
	in MC68030	in MC68030	in MC68030	in MC68030
	NA	1	NA	NA
	NA	NA	NA	NA
	1, 2, 4, 8	NA	1, 2, 4, 8	NA
	1, 2, 4, 8	NA	NA	NA
	1, 2, 4, 8	NA	1, 2, 4, 8	NA
	1, 2, 4	NA	1, 2, 4	NA
	single	dual	dual	dual
	stereo	stereo	stereo	stereo
	●	○	○	○
	●	●	●	●
	●	○	●	○
	●	●	●	●
	●	●	●	●
	●	●	●	○
	*	●	○	●
	○	○	●	○
	1*	○	3	6
	○	○	○	○
	●	●	●	●
	●	●	●	●
	4 x 12.4 x 14.9	13.5 x 9.7 x 10.9	5.5 x 11.9 x 14.4	5.5 x 18.7 x 14.4
	10 lb	22 lb	13.6 lb	24 to 26 lb

◊512K and 2-megabyte SIMMs are new products from Apple.
**More than 16 megabytes of RAM can be accessed only by A/UX and System 7.0.
††The optional LC 512K VRAM SIMM (video RAM) is needed.
§§Third-party products are available for audio input through any Mac's serial or SCSI port.
◊◊A third-party adapter is required to drive a video display.

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True Color Calibrator Display System™



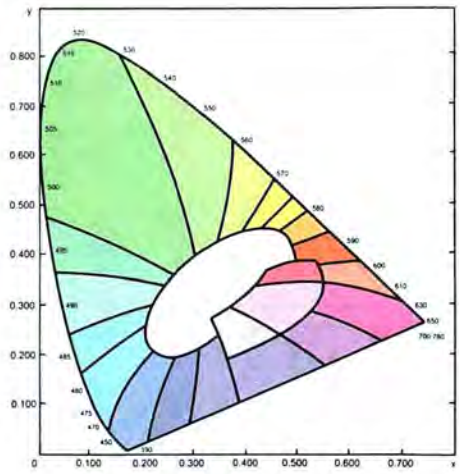
ROSES ARE X=0.7344, Y=0.2656; VIOLETS ARE X=0.1566, Y=0.0177.

Owing to variations in human perception, color, like beauty, is very much in the eye of the beholder. This being true, if we want to communicate accurately about color, we need to convert the language of art into something considerably more objective and exact: the language of science.

Some time ago, an international scientific team developed a mathematically reliable color system, known as CIE. This model is the basis for the new RasterOps® True Color Calibrator Display System.™

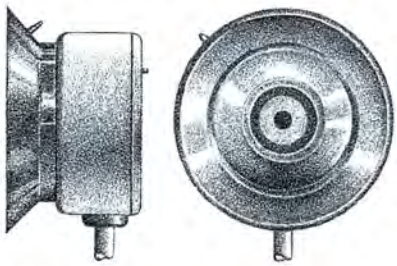
Due to temperature, humidity, and as yet-imperfect CRT technology, even the best and brightest display colors

can drift and fade over time. To compensate, the True Color Calibrator display has a built-in microprocessor which monitors performance on a continual basis and corrects instabilities with its own internal calibration routines.



The True Color Calibrator is based upon the CIE model which mathematically defines all available natural colors.

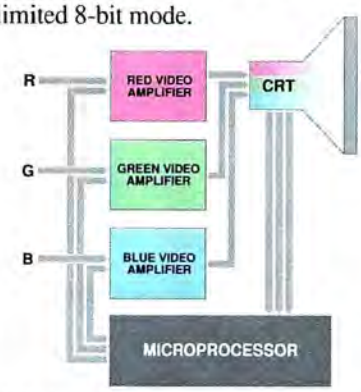
This self-calibration is performed automatically, *75 times a second* — well before the sharpest eyes would detect any variation in color. The net result is that roses and violets on a True Color Calibrator display will always remain true to their mathematically-defined color values. Whether three minutes, three days, or three months from now. And the system has a communication port which can send these scientifically precise formulas to other monitors and printers.



Unlike other optical sensors, RasterOps' Optisense is thermally stabilized to insure consistently accurate measurements.

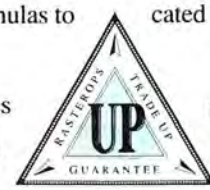
The True Color Calibrator also comes with an Optisense® optical sensor which, used just once a month, adjusts the system's self-calibration scheme for the inevitable aging of screen phosphors.

The makers of other calibration systems may make a big to-do about the optical sensor they provide. This is understandable, since that's all they provide. With no microprocessor in their display, they cannot offer automatic, continual calibration. The moment you remove the sensor, colors begin to drift and fade all over again. Which means their system is only as accurate as the number of times *per day* you stop and use the sensor. What's more, they recommend that calibration be performed only while in the more limited 8-bit mode.



Only the True Color Calibrator has a built-in microprocessor which continually recalibrates the display—75 times per second.

In deciding which calibration solution is in fact the most effective, it might be helpful to know that the world's most sophisticated electronic pre-press systems use the same microprocessor-controlled calibration we do. And further, that *MacUser* has hailed the RasterOps True Color Calibrator as "the most sophisticated monitor ever built".



Now you can upgrade anytime. Or extend your warranty with RasterCare.™

If your application calls for a truly stable and precise color environment, your best call would be to a RasterOps dealer. Or you can phone 800.468.7600 to find out more about the True Color Calibrator from RasterOps. The people who've got the art of color down to a science.

RasterOps®

THE ART & SCIENCE OF COLOR™

MOVING UP TO A BIG, FAST HARD DRIVE

You can never be too rich or too thin, but can you have a hard-disk drive that's too big or too fast?

BY
OWEN W. LINZMAYER
AND THE
MACUSER LABS
STAFF

What do big, fast hard-disk drives and good Thai food have in common? A little taste of either, and you're hooked forever — although an appetite for megabytes is harder to satisfy. Just install a network server for file sharing or a large multiuser database — or store dozens of 24-bit graphics, audio, and animation files on your stand-alone Mac — and you'll soon hunger for a bigger, faster hard-disk drive.

But there are special factors to consider when you buy a drive ten times the size of anything you've bought before. And with so many drives to choose from, deciding what to purchase can be a bit intimidating. Is it wiser to get just the storage space you need or to overbuy so you'll have room in the future? What's most important: price, performance, or reliability? And should you trust the tweaks that some manufacturers have made to their big-drive mechanisms to increase speed in high-use settings (see the

PHOTOGRAPHY: PIERRE-YVES GOAVEC


MICROTECH
POWERDrive
RELAX
RACET

Double-Duty Disks

Want up-to-the-millisecond backup of one hard disk onto another without doing a thing? That's the kind of data security you need in business — especially on a network — where the crash of a file server can halt your entire operation. Two new techniques — disk duplexing and disk mirroring — provide such supersecurity.

Both ideas are simple. Disk-duplexing systems add an extra SCSI port that writes data to a second hard drive at the same time it writes to the primary port and drive. Disk mirroring, on the other hand, is a software approach that first writes data to one hard drive and then to another — taking twice the time of a duplexing system. Both schemes read from one drive only, so performance doesn't suffer during read operations.

Golden Triangle's disk-duplexing system, called DiskTwin, consists of a NuBus SCSI controller board and a cdev that allows you to select the *primary* and *twin* drives and set the duplexer in active or standby mode. The card goes into a NuBus slot on your Mac and the cdev into the drive's System Folder. Most of the time, you never know that DiskTwin is there. Currently, if a fault occurs on the twin, it lets you know via an alert dialog box on your Mac; if it's the primary drive, however, your Mac hangs and you need to physically switch to the twin if you want to make it the primary drive. A switching mechanism to automate this process is in the works. Golden Triangle sells DiskTwin for $995. Golden Triangle Computers, 4849 Ronson Court, San Diego, CA 92111; (619) 279-2100.

Hard-disk-drive vendors have begun to offer packages that include the DiskTwin system. Procom throws one in for free if you buy two hard drives bigger than 650 megabytes and will sell you one for $495 if you buy two smaller drives. CMS intends to offer DiskTwin as part of a new backup product named Gemini. PLI also plans to offer the DiskTwin system at a special price if you buy it with any PLI drive.

Relax Technology has a product now under development that will let you "span" up to 12 SCSI hard drives to a single Mac SCSI port. This board, which will also contain a 1-megabyte cache, will allow you to duplex any number of drives connected to two SCSI ports.

Several hard-drive vendors are planning to introduce mirroring software. Storage Dimensions, Optima Technology, Mac-Tel, and FWB all have software that is shipping now or should be shipping by the time this article goes to press. All these programs will offer the same fault tolerance but with the performance handicap of duplicate writing cycles. When the drive is reading data, however, the programs may actually increase drive speed because of *elevator seeking*, which keeps track of the read/write heads in relation to the requested data and reads the data from the drive whose head is closest to it.

One problem both duplexing and mirroring schemes have not yet addressed is what happens when software corrupts a hard drive. If a virus infects one drive, it will be faithfully copied to the second drive. One solution, said to be under development by Optima, is to delay mirroring by a specified amount of time. In conjunction with automated virus-protection software, such a scheme could prevent the doubling of corrupted data. In that case, fault-tolerant systems could be intolerant just when they need to be.

— Andrew Eisner

"How It Works Faster" sidebar)?

To help you make the right selection amid a wide field of choices, MacUser Labs gathered 22 external hard-disk drives in the 300-megabyte range and subjected them to performance tests for speed and data throughput. We also surveyed dealers across the country to compile a unique street-price index to help strengthen your bargaining position. In addition, we investigated the service options offered by each vendor. Finally, we added it all up to pinpoint the best deals.

Learning the Mechanics

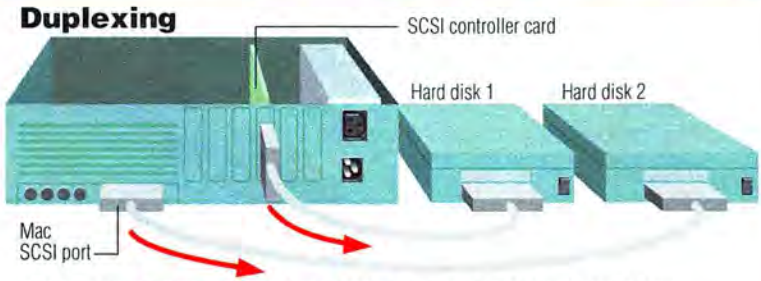
Although we found 22 vendors that offer drives in the 300-megabyte range, all their drive mechanisms come from only seven OEMs. The high-capacity-drive market is dominated by Seagate Technology, whose various mechanisms are used in 13 of the drives we reviewed. The next-most-ubiquitous OEM is Micropolis, which makes the mechanism used in 4 drives. Five other manufacturers were represented, each with a single entrant. Be aware that some vendors vary the OEM mechanisms based on customer request, market price, or availability. If you're interested in a drive because it contains a particular mechanism, be sure to specify the one you want. If a vendor isn't willing to commit to providing it, look elsewhere.

Although this report focuses on drives of about 300 megabytes, the actual capacities of the 22 drives range from 291 to 420 megabytes. (To see how this year's crop of drives compares to the past, see "Big Hard Disks," June '88, page 122.) As always, whenever you shop for drives, compare *formatted* capacities only. For the most part, advertised drive capacities closely approximate formatted capacities. Some of the drive names can be misleading, however — for example, the MacProducts Magic 380 actually yields only 325 megabytes when formatted.

Conventional wisdom holds that you can never have too much disk-storage capacity, but you may regret buying too much too soon. The hard-drive market is extremely competitive, and storage technology continues to advance at a dizzying rate. As a result, each year sees the introduction of higher-capacity disk drives at greatly reduced prices (see Figure 1). So when you buy a large drive, estimate how much storage capacity you are likely to need in the next year or two and try to pick a drive that fills only these short-range needs. By the time you outgrow this purchase, hard-drive prices will most likely have dropped because of advances in technology and the increasing number of large drives available. You can then expect to buy much more for less.

Cost Consciousness

Just because big hard drives have become more affordable doesn't mean that you can afford to take this



Disk-duplexing systems use an extra SCSI controller card to write data to two hard-disk drives at the same time.



Disk mirroring is a software approach that first writes data to one hard-disk drive and then to another – taking twice the time of a duplexing system.

purchasing decision lightly. The list prices of these drives run from a low of $1,395 for the 325-megabyte MacProducts Magic 380 to $4,395 for the 306-megabyte Optima MiniPak 310 and the 320-megabyte PLI PL 320F Turbo.

Because list prices don't tell the whole story (drives sold through dealers are often discounted far below their suggested retail price), *MacUser* contacted a representative sampling of dealers throughout the United States to determine the average — not necessarily the lowest — street prices of the drives we reviewed. We found that manufacturers that sell directly to customers usually have the best prices, but even street prices for drives sold through dealers average 25 percent below the manufacturer's suggested retail price.

Additionally, mail-order houses often offer bundling schemes that can save you money on the drive as well as on the software that comes with it. Mac-Tel in Austin, Texas, for example, bundles a very versatile software package with several Seagate-based drives in the 300-megabyte range. You can get a 330-megabyte Wren Runner mechanism (more prosaically known as the Seagate ST4385NM) with backup, encryption, disk-mirroring software, and software that supports A/UX and ProDOS, all for $1,999. But remember: Mail-order houses usually can't give you the same level of after-sale service that a dealer can.

To see which drives provide the most bytes for the buck, divide formatted capacity by street price (see Figure 2). High-capacity hard drives tend to be more cost-effective than smaller models, with the best bargains (the MacProducts Magic 380, HDI POWERDrive 320, and La Cie ZFP 400) at slightly more than $4 per megabyte. In contrast, premium-priced drives (the PLI PL 320F Turbo, Procom MD 320, and Optima MiniPak 310) cost more than $10 per megabyte.

SCSI Standards

All the external hard-disk drives reviewed this month are SCSI devices that attach to the DB-25 connector on the back of all Macs since the Plus. The SCSI standard lets you connect up to seven devices — hard drives, scanners, printers — in a daisy chain, with each device plugged into the back of the next. Theoretically, all you need to do is make sure that you assign each device a unique SCSI ID number and that the devices on both ends of the chain are terminated. It sounds easy, but it's not (see "A Beginner's Guide to Daisy Chains," August '90, page 243).

Drives usually arrive on your desk with a SCSI ID number already assigned, but sometimes that number is already taken by some other SCSI device attached to your Mac. Don't worry. Resolving SCSI ID conflicts is simple — usually. Vendors provide several ways to set SCSI ID numbers. The choices include mechanical settings such as DIP or rotary switches, push buttons, and thumb wheels or special software "switches" that alter nonvolatile memory in the drive's controlling electronics.

DIP switches (used only on the Mirror MP290 among the drives we tested) are a nuisance, because you must interpret their binary settings; the manufacturer usually provides a DIP-switch map, though. The software-based solutions offered by Cranel, MacProducts, and SuperMac are a little better, but be careful not to lose the utility disk. In general, external ID switches — push buttons, thumb wheels, and rotary switches — are best, because you can see the current ID setting at a glance.

More problematic and potentially more damaging to your data is the part of the SCSI standard that requires that devices at either end of the daisy chain be *terminated*. This requirement ensures that all signal voltages fall reliably within the right range and prevents signal reflections from appearing on the SCSI lines. It

How It Works Faster

The prices of hard-disk drives are constantly declining while their capacity and speed continue to increase. Here are some of the ingenious tricks OEMs are using to eke greater performance out of their drives.

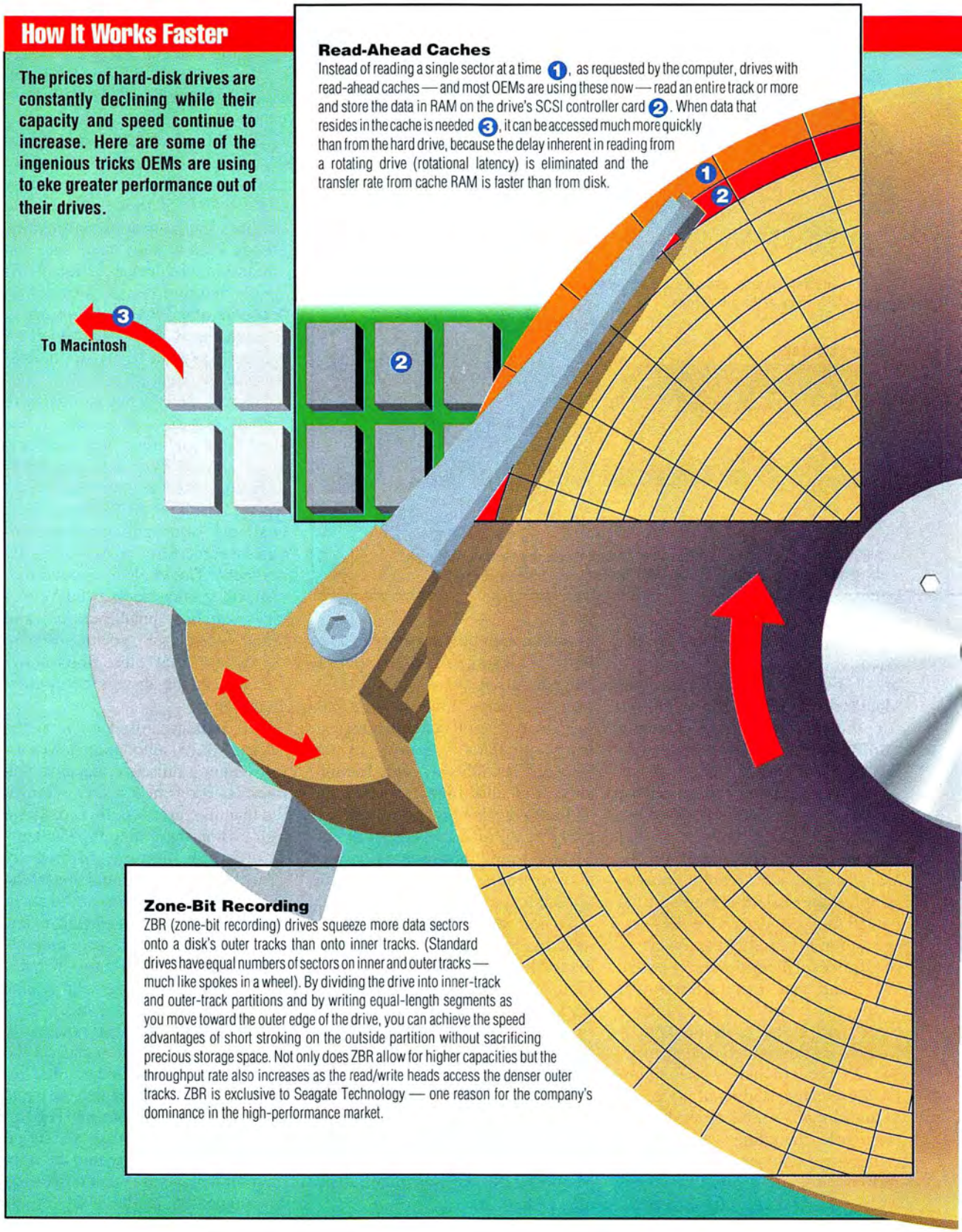
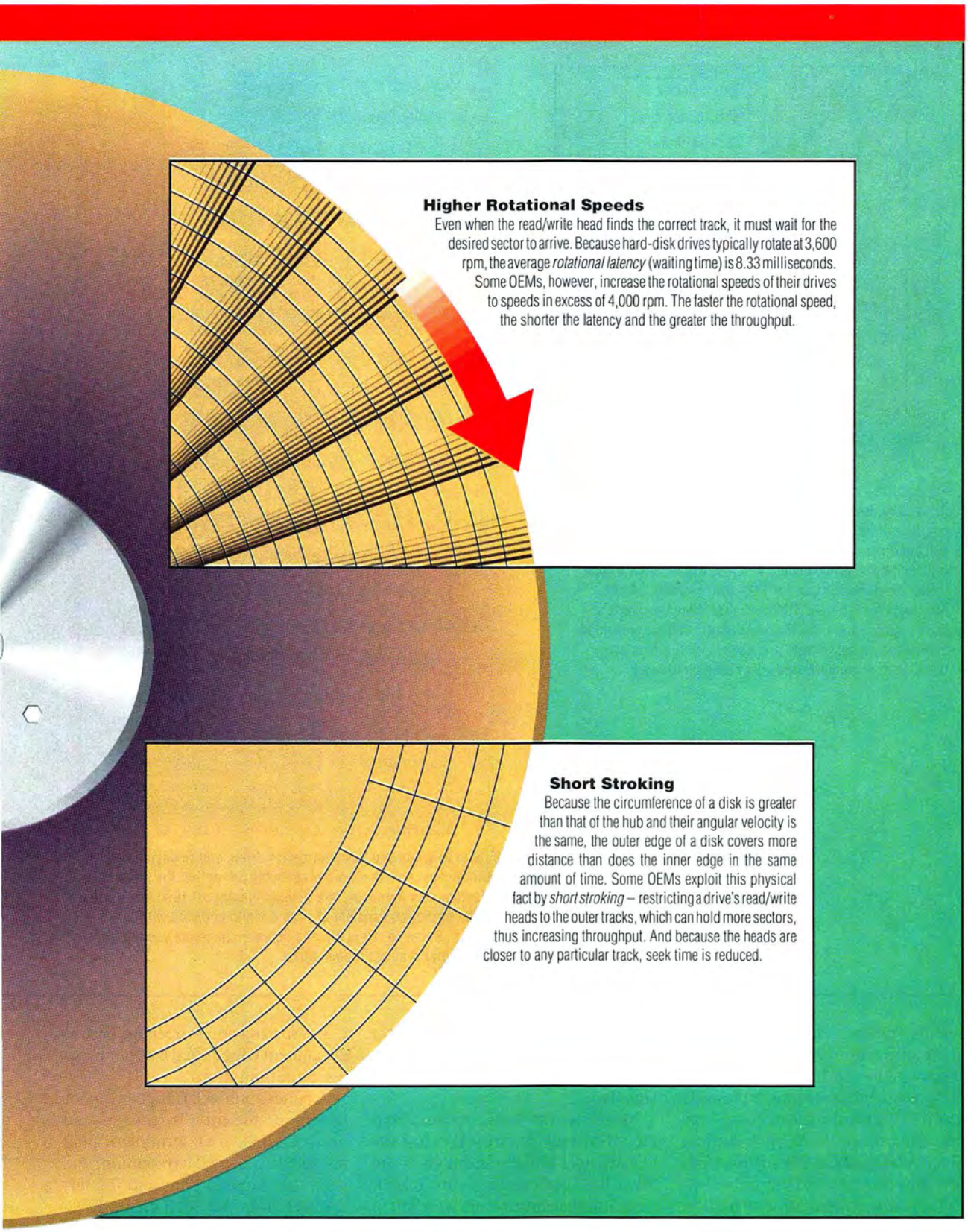


ILLUSTRATION: K. DANIEL CLARK



Higher Rotational Speeds

Even when the read/write head finds the correct track, it must wait for the desired sector to arrive. Because hard-disk drives typically rotate at 3,600 rpm, the average *rotational latency* (waiting time) is 8.33 milliseconds. Some OEMs, however, increase the rotational speeds of their drives to speeds in excess of 4,000 rpm. The faster the rotational speed, the shorter the latency and the greater the throughput.

Short Stroking

Because the circumference of a disk is greater than that of the hub and their angular velocity is the same, the outer edge of a disk covers more distance than does the inner edge in the same amount of time. Some OEMs exploit this physical fact by *short stroking* – restricting a drive's read/write heads to the outer tracks, which can hold more sectors, thus increasing throughput. And because the heads are closer to any particular track, seek time is reduced.

Figure 1: Declining Cost per Megabyte

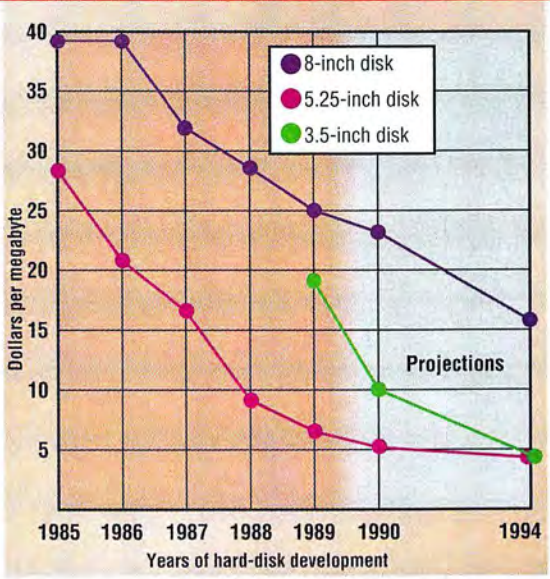


Figure 1: In five years, 5.25-inch hard-disk drives have drastically dropped in price. One megabyte now costs just one-fifth of its 1985 price. This trend toward cheaper drives will continue, with 5.25-inch drives gradually being replaced by smaller, faster, and less expensive 3.5-inch drives. Projected prices for 1994 are less than $4 per megabyte for 3.5- and 5.25-inch disk drives — some drives, such as the MacProducts Magic 380, approach $4 per megabyte now. (Data and estimates courtesy of Dataquest, a computer-industry research group.)

Figure 2: Cost per Megabyte

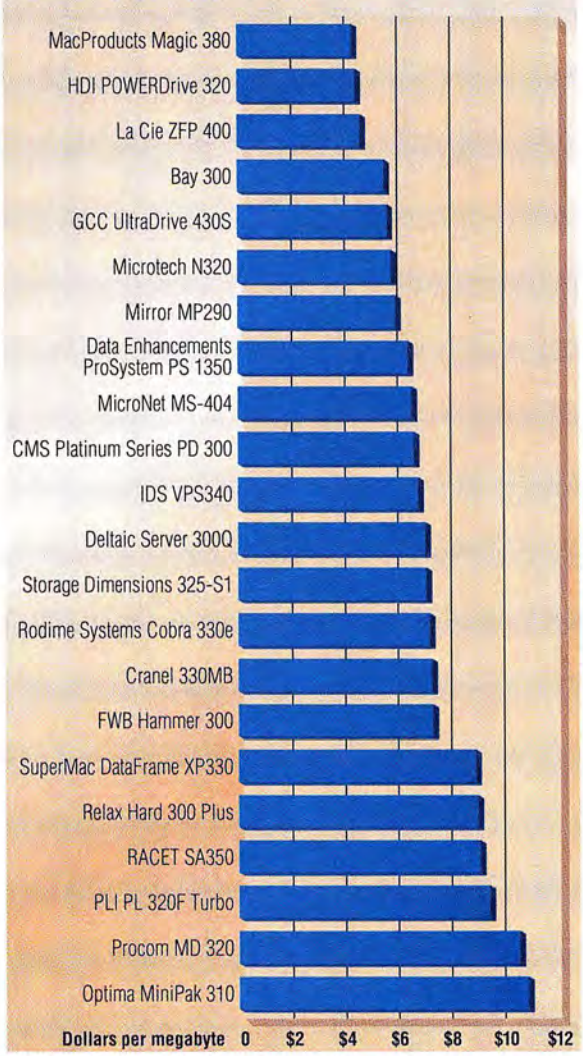


Figure 2: When you buy a hard-disk drive, you're paying for storage space — the more megabytes per dollar, the more cost-effective your purchase. We divided the August 1990 street price by the formatted capacity of each drive to come up with these figures. Because street prices fluctuate, the quote you get from your dealer may not match ours.

sounds very precise, but in practice SCSI termination is often a black art about which even the experts strongly disagree on the best approach. Apple itself doesn't terminate its computers (as called for in the SCSI specifications), and the Mac IIfx differs from previous Macs in that it requires so-called black terminators with built-in filter capacitors that "absorb" short pulses that the SCSI controller chip might otherwise interpret as control signals.

Most drive mechanisms come from the OEM with removable terminating resistors already installed in the drive. In 12 of the drives we evaluated, these internal terminators were left in place, forcing you to open the case to get at them (if required by your hardware configuration).

A better approach is for the vendor to remove the drive's resistors and provide an external terminator plug instead. If you need termination, you slide the supplied plug into the last connection in the SCSI chain. Even

Figure 3: Seek Times

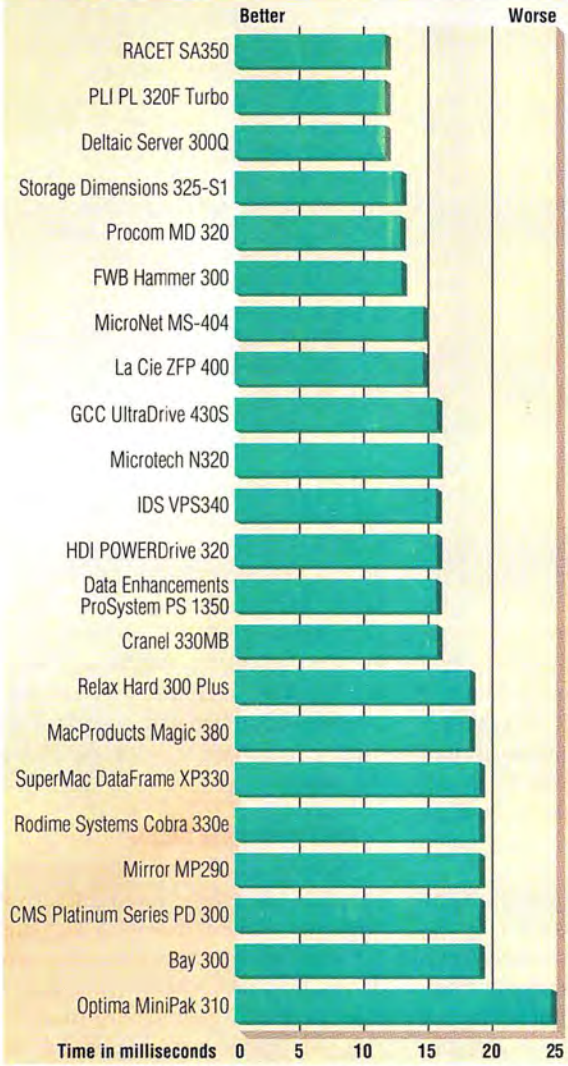


Figure 3: We used the popular utility SCSI Evaluator to determine how quickly each drive could find data — its *seek time*. SCSI Evaluator sends a series of seek commands as fast as the drive and the Mac can handle them and reports an average of the seek times. Although most drives are optimized for repeated fast seeks, the Optima MiniPak 310 adds a special wait state between seeks to protect its read/write heads, effectively doubling its seek time.

Figure 4: Throughput

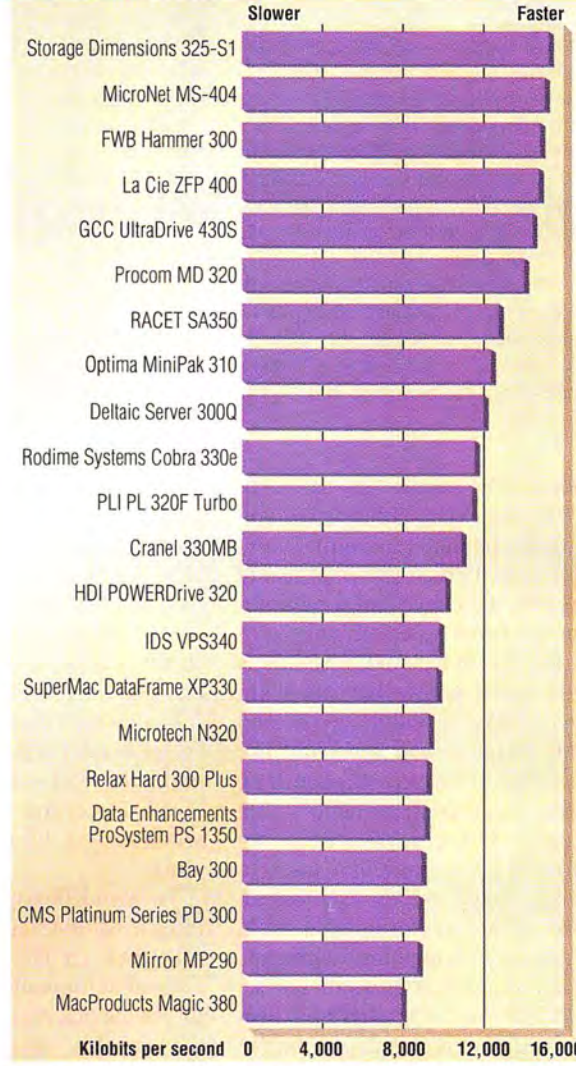


Figure 4: Again using SCSI Evaluator, we tested how much data each drive could read or write per second — its *throughput*. Read-ahead caches — such as those in the Seagate mechanisms of the Storage Dimensions, MicroNet, FWB, La Cie, and GCC drives — speed up throughput for reads and writes of the variable-sized files simulated by SCSI Evaluator.

though it's one more thing to lose or have fall off, the termination plug is simple and effective, and you can easily tell whether it's installed or not. Deltaic, FWB, GCC, Optima, RACET, Relax, and Storage Dimensions have chosen this external-termination scheme for their drives. iDS Systems, PLI, and Procom take an even better approach by providing externally switchable built-in SCSI termination that can be turned on or off.

Software Setup

Most hard drives come preformatted by the vendor, ready to use. The way the disk has been formatted, however, may not be best for the kind of Mac you have. If, for example, you use an accelerator, you'd do best to choose a higher-performance format, so you may need to reformat the drive. The vendor should provide you with utilities to do this.

Some formatting software can detect the type of Mac you're using and

On the Horizon

New drives are appearing all the time, even as we go to press. Micropolis is now marketing its 330-megabyte Micropolis 1680 directly (it's already the OEM for several vendors) for $1,995. And the Metro 335, a new drive from EMAC for $2,499, should be out by the time you read this. The EMAC drive uses a Maxtor mechanism, has a two-year warranty, and comes bundled with Norton Utilities.

Improvements in hard-disk-drive technology also show no signs of slowing down. Just around the corner, you're going to see high-capacity drives that are smaller, cheaper, and faster. Expect to see more 3.5-inch drives costing less than $4 per megabyte and data-transfer rates pushing 5 megabytes per second.

Faster rotational speeds will help new drives increase both seek times and throughput rates. Today, most drives spin at 3,600 rpm. Drives of tomorrow will spin at speeds pushing 5,400 rpm, so data will reach a head much faster after a seek and will stream through the head at a higher rate. Hewlett-Packard has announced a 4,000-rpm drive, and Micropolis will soon introduce a 5,400-rpm drive.

Seagate Technology has announced two new 3.5-inch, 4,400-rpm hard drives — the 426-megabyte ST1480NM and the 331-megabyte ST1400NM. According to Seagate, these SCSI units will offer throughput as fast as 5 megabytes per second and a 14-millisecond seek time. Expect to see high-speed, high-capacity 3.5-inch drives from Quantum as well. The new ProDrive 425 and ProDrive 330 boast an access time of 14 milliseconds and have a throughput of 5 megabytes per second, according to Quantum.

Faster SCSI implementations will also help get data into the Mac faster. When you buy a top-of-the-line MicroNet drive, you can now couple it with the company's

automatically format the drive for use with that Mac. Others give you this option manually. In either case, choosing an alternative format geared to the Mac you have can sometimes affect the drive's performance profoundly. To understand why this is so, you need to know what it means to *format* a drive, install its *driver*, and change its *interleave* (see also "The File System," October '90, page 279).

Drives come from the factory with concentric circles, or *tracks*, and a way for locating any particular track (a *servo* strategy) already established. During a *low-level format* of a drive, its tracks are divided into segments, or *sectors*, and bad areas or sectors are locked out. The drive is then *initialized*; that is, a partition map of the drive is laid down (you can have two or more partitions), a driver is installed, and the drive is then ready to receive data. When data is subsequently written to the drive, it's written sector by sector by the same head that will read it later. When data is requested from the Mac, the drive sends it back one sector at a time, waiting for the go-ahead from the Mac (through the SCSI interface) before sending the next sector.

It's here that questions of efficiency arise. If the requested data is in contiguous sectors and the SCSI interface gives the go-ahead quickly enough, the drive will be able to efficiently transfer all the necessary data in one pass of the track. If, however, the SCSI interface is too slow for the drive — as might be the case with a Mac Plus or SE — the drive will be able to transfer only one sector of data per rotation of the disk and will have to wait at least another full rotation before the next proper sector of data is correctly positioned under the read/write head. Each mechanical rotation requires about 1/60 second — a lifetime in computer terms.

To avoid this time-wasting spinning, hard-disk vendors use a formatting trick called *sector interleave*. Instead of logically consecutive sectors being placed one after another on the hard disk's magnetic platter during formatting, they're laid out in an alternating pattern, occupying every second or third sector. While the drive waits for the Mac to catch up, only the intervening sectors (rather than the whole track) spin past before it reads again. As a general rule, the best interleave for most disks on an unaccelerated Mac Plus is 3:1, meaning that three sectors must spin by for each sector that is read. With a Mac SE, the best interleave is 2:1, and Macs in the II line perform best with a 1:1 ratio.

Of all the drives we tested, only those from Cranel, Deltaic, RACET, and SuperMac do not have formatters to let you set the interleave. Keep in mind, however, that many third-party hard-disk software utilities — such as La Cie's Silverlining, On Track's Disk Manager Mac, and DJK Development's SCSI Commander — let users select the interleave. Their drivers may increase performance over those bundled with your drive, if they're compatible with the drive (most are).

The Faster, the Better

Volume aside, for most buyers, speed is the most important drive attribute. Although drivers account for some speed differences between drives, it is the mechanism that determines a drive's overall performance.

If you plan to use a big hard drive as a server, you need one that can quickly move its read/write heads from track to track. That's what happens when multiple users request data that resides in different places on the drive's platters. In that case, you should concentrate on finding a drive with a low *seek time* (usually represented in milliseconds) — the average time it takes the read/write heads to move across one third of the platter. Unfortunately, not everyone agrees on how to measure this, so two vendors may claim different seek times for the same drive mechanism. What's more, once the data has been found, a drive's *throughput* — the

NuPORT, a SCSI NuBus card that replaces the Mac's sluggish 1.4-megabyte-per-second SCSI port with its own 4.4-megabyte-per-second SCSI screamer. The Mac's current SCSI limitations will disappear when (or *if*) the emerging SCSI-2 standard is implemented on Macs as well as drives. SCSI-2 provides new protocols that provide better error handling, a wider data bus (and an extra connecting cable), and faster data transfer. If all aspects of the "Wide" and "Fast" SCSI-2 protocols are implemented, throughput could reach a blazing 40 megabytes per second.
— Andrew Eisner

amount of data it can deliver to your Mac in a given amount of time — is more crucial than its seek time.

To obtain a consistent measure of seek time, we used the shareware utility SCSI Evaluator, available from most on-line services (including Zmac) and user-group program libraries. Our benchmark platform consisted of a 4-megabyte Mac IIci running System 6.0.5. Each hard drive was formatted at a 1:1 interleave — the appropriate interleave for the Mac II family — using each vendor's own formatting software.

The Deltaic Server 300Q, PLI PL 320F Turbo, and RACET SA350 tied for first place, with average seek times of 12 milliseconds (see Figure 3). Near the other end of the scale were several drives with 19-millisecond seek times. The Optima MiniPak 310 came in last at 25 milliseconds (the OEM rates it at 12.5 milliseconds), because of a special wait state that protects against testing programs such as SCSI Evaluator that do multiple seeks! [*Optima representatives explain that, for reasons of reliability, they purposely pause their drive between the multiple seeks requested by SCSI Evaluator. Optima claims — and rightly — that seek-seek-seek sequences don't occur in the real world: Usually, heads seek a track and then read or write before another seek is requested. — Ed.*]

If you're using a stand-alone Mac and working with large files — 24-bit graphics, animation sequences, source code, or audio samples — then you should search for a drive with a high throughput rate. A drive's throughput rate — typically expressed as kilobits or megabytes per second — represents how much data it can deliver in one second. To measure throughput, we instructed SCSI Evaluator to write random blocks of data to the drives (see Figure 4) and measured the results.

As a class, drives containing Seagate ST2502NM and ST2383NM mechanisms proved fastest, with throughput rates of around 15,000 kilobits per second. Speed variations among like mechanisms can be attributed to manufacturing deviations and differences in driver software. The fastest drives are sold by FWB, GCC, La Cie, MicroNet, Procom, and Storage Dimensions. The slowest drive by far, the MacProducts Magic 380, managed a lowly 8,132 kilobits per second with its MiniScribe mechanism.

Finally, to test real-world speed, we used DiskBasher!, a test utility developed by MacUser Labs. DiskBasher! simulates typical drive performance by reading and writing actual "files," with all the overhead involved. The DiskBasher! results (lower times indicate faster drives) have a high correlation with the SCSI Evaluator results and are included in Table 2.

At Your Service

In one respect, hard drives are like politicians and S&Ls: The bigger they are, the harder they fall. Because you stand to lose so much valuable data if you experience a problem with a high-capacity hard drive, reliability is an extremely important issue. Unlike speed, which we can accurately measure with a suite of benchmarks, there's no way MacUser Labs can empirically test the long-term reliability of drives. With MTBF (mean time between failures) ratings in excess of 100,000 hours, we could wait for more than 11 years before a drive took a dive. So we did the next-best thing: We investigated the service offered by each of the 22 vendors (see Table 1).

The warranty periods offered run from the common one year to the truly generous five years (Cranel and Microtech). Some vendors offer optional extended warranties for an average cost of several hundred dollars per year. The bargain in this category is Deltaic's five years of additional coverage for only $100. Given the hourly rates charged by service technicians and the high price of replacement parts, extended-warranty plans often pay for themselves the first time you send a drive in for repair. One-third of the vendors offer 30-day money-back guarantees, so if you are unhappy with their products for any reason, you can return them for a full refund.

If something goes wrong with your drive, it's comforting to know that help is just a phone call away. Although all the vendors we surveyed operate technical-support hot lines, only seven provide toll-free support. If the problem requires you to return the drive for service, consider where you must send it and how long it will take before you get it back. If you buy a drive mail-order, you usually have to return the drive directly to the vendor, which adds shipping delays to the time required to fix the drive.

One of the benefits of buying retail is that you can usually return the drive to the dealer for repair. Keep in mind, however, that most dealers lack adequate facilities and simply ship the drive back to the manufacturer. And some make no promises whatsoever about turnaround time, although most vendors attempt to get your drive back to you within two to three working days of receipt. Optima, RACET, and Rodime guarantee 24-hour turnaround times; at the opposite end of the spectrum is Cranel's 30-day turnaround time, which is pretty lax.

Table 1: Service and Support

● = yes ○ = no	Standard warranty	Extended warranty	Money-back guarantee	Toll-free support	Service center	Guaranteed turnaround	Data recovery
Bay Microsystems	1 year	none	none	○	direct	none	●
CMS Enhancements	1 year	$299/year	none	○	dealer	none	○
Cranel	5 years	$295/year	none	●	direct	30 days	○
Data Enhancements	1 year	none	none	○	dealer or direct	none	○
Deltaic Systems	1 year	$100/5 years	30 days	○	dealer or direct	none	●
FWB	1 year	$280/year	none	○	dealer	48 hours	●
GCC Technologies	2 years	none	30 days	●	dealer or direct	72 hours	●
HDI	1 year	none	30 days	●	direct	48 hours	○
iDS Systems	2 years	none	none	●	dealer	48 hours	●
La Cie	2 years	none	none	●	dealer or direct	72 hours	●
MacProducts USA	1 year	none	30 days	○	dealer or direct	none	●
MicroNet Technology	1 year	$195/year	none	○	direct	48 hours	○
Microtech International	5 years	none	none	●	dealer or direct	48 hours	●
Mirror Technologies	1 year	$177/year	30 days	○	direct	48 hours	●
Optima Technology	1 year	$600/2 years	none	○	dealer	24 hours	○
PLI	1 year	$440/year	30 days	●	dealer or direct	48 hours	●
Procom Technology	1 year	none	none	○	dealer or direct	48 hours	○
RACET computes	3 years	none	none	○	dealer	24 hours	○
Relax Technology	1 year	none	30 days	○	direct	48 hours	●
Rodime Systems	2 years	none	none	○	dealer	24 hours	●
Storage Dimensions	2 years	none	none	○	dealer or direct	48 hours	●
SuperMac Technology	1 year	none	none	○	dealer or direct	72 hours	○

Table 1: Don't judge postsale service and support just by the length of the warranty or warranty extension. Also take into account money-back guarantees, phone support, the location of the repair service, guaranteed turnaround times for repairs, and the availability of data-recovery services. Having access to a variety of support services is one of the advantages of buying through a dealer as opposed to buying mail-order, even though a mail-order house may give you a fantastic deal.

Perhaps the most important service consideration is whether the vendor will attempt to recover your data or will simply swap out faulty mechanisms. Although nobody can guarantee 100-percent success at recovering data from a damaged disk, many common problems can be resolved easily with the help of a good utility program such as Symantec's SUM II or Norton Utilities for the Macintosh. Vendors that offer data-recovery services (and more than half of them do) often do so only at the customer's request and expense. Depending on your data's value, you must determine when data recovery becomes a cost-prohibitive option. The best preventive measure is to back up, back up, and then back up again. To help simplify this tedious chore, investigate some of the new mirroring and duplexing techniques that automatically copy your data to another drive (see the "Double-Duty Disks" sidebar).

Software Bundles

In an effort to differentiate their offerings from competitors', many vendors sweeten their deals with free software. Bundled software runs the gamut from scads of shareware freebies thrown in seemingly for sheer volume to well-chosen commercial applications that normally retail for hundreds of dollars. GCC, iDS, La Cie, MacProducts, Microtech, Mirror, and PLI all fill up their drives with megabytes of shareware, public-domain, and demoware programs. If you're just getting started and need to build a software library, these loaded drives may be a good idea, saving you the time and expense of accumulating the software yourself — although there's no guarantee that it will all work.

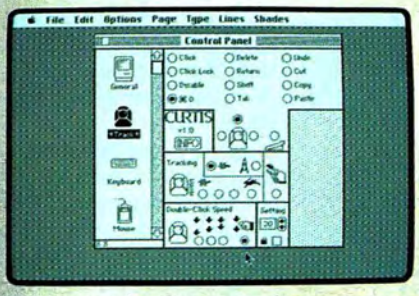
More-discriminating buyers may be interested in specific commercial programs such as DiskFit, Fastback II, MacTools Deluxe, Norton Utilities, Silverlining, SUM II, or SuperSpool, to name a few. These packages, in various combinations, are available from CMS, GCC, La Cie, Microtech, Optima, Rodime Systems, Storage Dimensions, and SuperMac.

Table 2 includes a checklist of the types of software bundled with each hard drive. Some of the more useful utilities handle interleave, partition-

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ing, password protection, data encryption, disk optimization, backup, file recovery, mirroring, and spooling.

Partitioning software can divide a large physical drive into several smaller logical drives that each appear on the desktop individually. Some vendors allow you to set up A/UX and ProDOS (the Apple II operating system) partitions on their drives so that you can share the drive with UNIX and Apple II users.

Password protection prevents others from accessing your drive without your knowledge. Data encryption scrambles the contents of files but does not prevent you from performing regular file maintenance.

Disk optimizers improve performance by reorganizing drive contents into contiguous blocks so that the read/write heads needn't roam the disk looking for bits and pieces of files. Backup software, such as DiskFit, Fastback II, and Total Recall, copies files from the hard drive to another medium for safekeeping. File-recovery utilities, such as Norton Utilities and SUM II, can rescue deleted or damaged files. Finally, print spoolers, such as QuickSpool II and SuperLaserSpool, take care of printing in the background.

The Hard Part

New drives are appearing all the time, and attentive buyers will want to keep their eyes peeled for the latest advances in technology (see the "On the Horizon" sidebar). Even with the current list of 22 hard drives we tested, making the right selection is difficult. You must balance your needs against your means, make trade-offs between value and speed, and consider a host of intangibles such as the vendor's reputation, construction quality, and aesthetics. Although there's no "best" drive for every application, check out the "Bottom Line" sidebar for our recommendations. And remember, other storage choices are available — for example, if you need enormous storage capacity that's removable and transportable, look at "Maximum Movable Megabytes: Erasable Optical Drives" in last month's issue.

San Francisco author Owen W. Linzmayer could probably fill two 300-megabyte hard drives with all the articles he's written in his ten-year career.

The Bottom Line

To many people, a hard-disk drive is just a commodity item — an expensive filing cabinet. We'd like to dispel that myth. Although vendors must choose from the same OEM mechanisms available to their competitors, some have taken great pains to move their products a notch above the others.

For general use — and especially if you're storing large database, graphics, sound, or animation files — we recommend the high-throughput **GCC UltraDrive 430S** ($2,699), **La Cie ZFP 400** ($1,999), and **MicroNet MS-404** ($3,795). All three drives are based on the same 423-megabyte Seagate ST2502NM mechanism, which has the greatest average throughput (15,248K per second) of all the mechanisms we evaluated and has a respectable seek time of around 15 milliseconds.

All have carefully assembled custom-designed cases — the MicroNet MS-404 especially shows excellent-quality workmanship. We couldn't rate it higher than the GCC and La Cie offerings, however, because it's substantially more expensive and does not come with any bundled software aside from a proprietary installation utility.

For a thousand dollars less, GCC includes a QuickDraw print spooler, SUM II, 3.5 megabytes of public-domain software, and its own envelope-printing utility.

La Cie bundles 5 megabytes of public-domain software, its own Silverlining formatting software, and the Norton Utilities for drive maintenance and repair. Both firms offer comprehensive service options, and GCC even backs its drive with a 30-day money-back guarantee. Of all the high-capacity drives, the price/performance champ is the very affordable La Cie ZFP 400, its only flaw being internal termination.

If you're equipping a network server, two other drives to consider are the **Storage Dimensions 325-S1** ($3,499) and **FWB Hammer 300** ($3,495). Both use the 325-megabyte Seagate ST2383NM mechanism and carry similar list prices, and both are often heavily discounted to around $2,350. The throughput of these drives almost equals that of the ST2502NM drives mentioned earlier, and seek times are even better (13 milliseconds). The Hammer 300 just missed a five-mouse rating, because of its undistinguished proprietary software and generic metal case. The Storage Dimensions 325-S1 has a custom plastic case, the front of which pops off to reveal that the unit is prewired to accept a second mechanism in the same housing — a nice option if you foresee adding more storage capacity in the future.



Clockwise from left: The La Cie ZFP 400 is the price/performance leader, but the GCC UltraDrive 430S and the solidly built MicroNet MS-404 are close challengers for our top pick. For those who need a network server with superquick seek times and healthy throughput, the Storage Dimensions 325-S1 and FWB Hammer 300 (not shown) are also excellent choices.

Although it is the most cost-effective drive on a price-per-megabyte basis, don't be tempted by the **MacProducts Magic 380** ($1,395). It's the slowest of all the drives by far and is a bear to set up because of its software SCSI-ID selection, internal termination, and unshielded 25-pin SCSI connectors.

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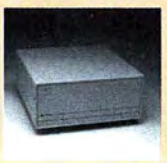
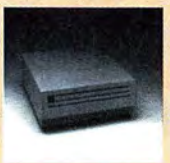
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Table 2: Features of Big, Fast Hard-Disk Drives

● = yes ○ = no	 **Bay** **300** **ŧŧŧ**	 **CMS** **Platinum Series PD 300** **ŧŧŧ**	 **Cranel** **330MB** **ŧŧŧ½**	 **Data Enhancements** **ProSystem PS1350** **ŧŧŧ**
Comments	Slow seek times. Low throughput.	Slow seek times. Low throughput. Good software.	Average seek times and throughput. Largest case. Good support.	Average seek times. Low throughput.
Price (list/street)	$1,650/$1,650	$3,299/$2,000	$2,350/$2,350	$3,189/$2,200
Capacity (advertised/actual)	300/291 MB	300/291 MB	330/321 MB	330/330 MB
Seek time (advertised/actual)	16.5/19 ms	19/19 ms	16/16 ms	14/16 ms
DiskBasher! results (seconds)	21.4 sec	21.3 sec	18.0 sec	22.7 sec
Technology				
OEM mechanism	Seagate ST4350NM	Seagate ST4350NM	HP 97544SU	Micropolis 1684-07
Platters (number and size)	five 5.25-in.	five 5.25-in.	eight 5.25-in.	four 5.25-in.
SCSI				
ID selector	thumb wheel	push button	software	thumb wheel
Termination	internal	internal	internal	internal
Cable (length, type)	1.5 feet, 50/25-pin	6 feet, 50/25-pin	2 feet, 50/25-pin	3 feet, 50/25-pin
Software				
Bundled	proprietary	proprietary, SUM II	UniMac StorWare	proprietary, SCSI Commander
User-selectable interleave	●	●	○	●
Partitioning	○	●	●*	○
Password protection	○	●	●	○
Data encryption	○	●	○	○
Disk optimizer	○	●	○	○
Backup	○	●	○	○
File recovery	○	●	○	○
Print spooler	○	○	○	○
Case				
Fan	●	●	●	●
Indicator lights	access, power	access	access, power	access, power
Size (L x W x H, in.)	10 x 9.75 x 4.25†	11.25 x 10 x 4.5†	13 x 9.25 x 5.75	11 x 10 x 3.5†
Weight	12 lb	15.5 lb	18 lb	10.5 lb
Construction	plastic	metal	metal	metal
Fuse	external	internal	external	internal
	Bay Microsystems 210 Columbus Ave. Suite 108 San Francisco, CA 94133 (415) 563-8392	CMS Enhancements, Inc. 1372 Valencia Ave. Tustin, CA 92680 (714) 259-9555	Cranel, Inc. 510F E. Wilson Bridge Rd. Worthington, OH 43085 (800) 288-3475 (614) 433-0045	Data Enhancements 31328 Via Colinas, Bldg. 102 Westlake Village, CA 91362 (818) 879-2700

*Supports A/UX partitioning

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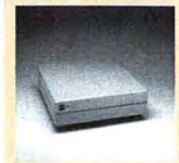
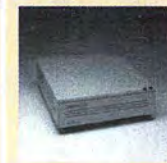
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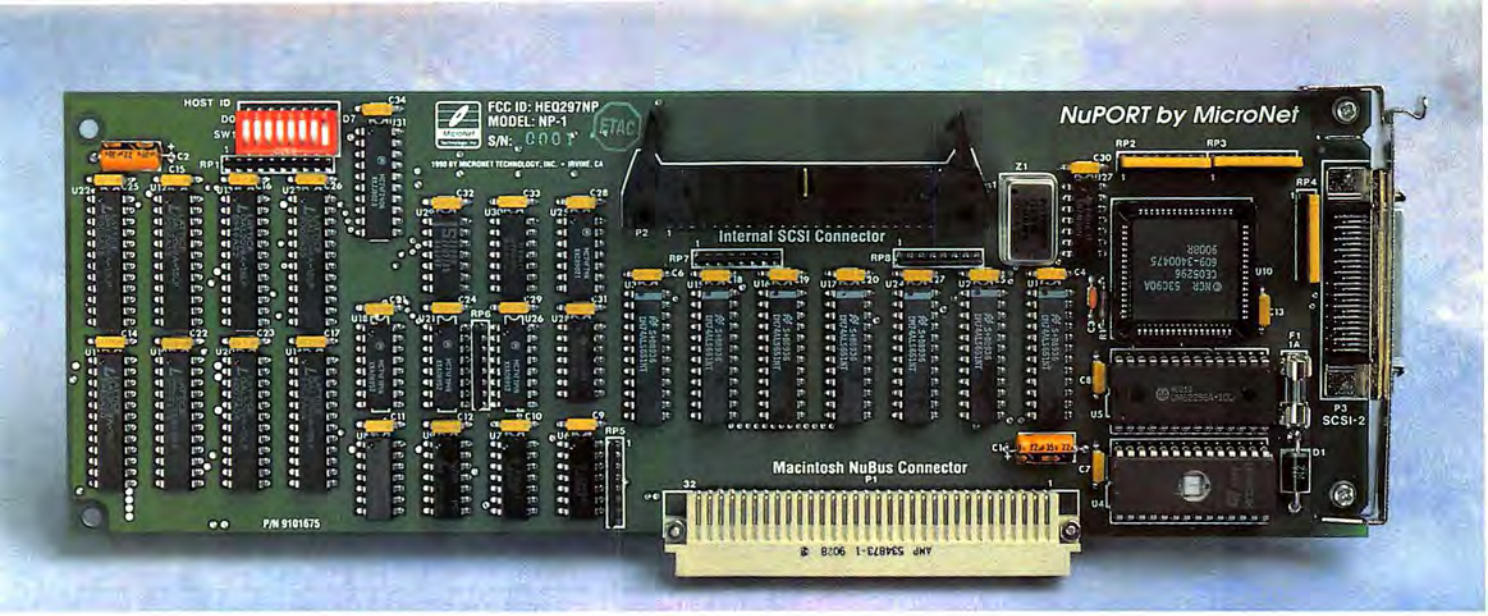
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Table 2: Features of Big, Fast Hard-Disk Drives, continued

● = yes ○ = no	 **Deltaic** **Server 300Q** ★★★½	 **FWB** **Hammer 300** ★★★★½	 **GCC** **UltraDrive 430S** ★★★★★	 **HDI** **POWERDrive 320** ★★★½
Comments	Fastest seek times. Average throughput.	Fast seek times. High throughput. Small case.	Average seek times. High throughput. Good software and support.	Inexpensive. Average seek times and throughput.
Price (list/street)	$2,299/$2,299	$3,495/$2,400	$2,699/$2,499	$1,499/$1,499
Capacity (advertised/actual)	320/326 MB	300/323 MB	430/428 MB	320/330 MB
Seek time (advertised/actual)	10.7/12 ms	13/13 ms	16/16 ms	16/16 ms
DiskBasher! results (seconds)	17.3 sec	14.4 sec	14.9 sec	20.0 sec
Technology				
OEM mechanism	Seagate ST4385NM	Seagate ST2383NM	Seagate ST2502NM	Micropolis 1684-07
Platters (number and size)	eight 5.25-in.	four 5.25-in.	four 5.25-in.	four 5.25-in.
SCSI				
ID selector	push button	push button	push button	push button, software
Termination	external	external	external	internal
Cable (length, type)	1.5 feet, 50/25-pin	2 feet, 50/25-pin	2 feet, 50/25-pin	2 feet, 50/25-pin
Software				
Bundled	proprietary	proprietary	proprietary, QuickEnvelope, QuickSpool II, SUM II, 3.5 MB public-domain	Disk Manager Mac
User-selectable interleave	○	●	●	●
Partitioning	○	●	●*	●
Password protection	○	●	●	●
Data encryption	○	●	●	○
Disk optimizer	○	○	●	○
Backup	○	●	●	○
File recovery	○	○	●	○
Print spooler	○	○	●	○
Case				
Fan	●	●	●	●
Indicator lights	access, power	access, power	access, power	power
Size (L x W x H, in.)	9.75 x 9.75 x 4.5†	9.75 x 9.75 x 2.25†	11 x 9.5 x 3†	9.75 x 9.75 x 2.5†
Weight	12 lb	8 lb	9 lb	7 lb
Construction	metal	metal	plastic	metal
Fuse	external	external	internal	internal
	Deltaic Systems 1701 Junction Ct. Suite 302B San Jose, CA 95112 (408) 441-1240	FWB, Inc. 2040 Polk St., Suite 215 San Francisco, CA 94109 (415) 474-8055	GCC Technologies 580 Winter St. Waltham, MA 02154 (800) 422-7777 (617) 890-0880	Hard Drives International 1912 W. Fourth St. Tempe, AZ 85281 (800) 733-3475 (602) 967-5128

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True NuBus Bootable Device	Yes	No	No
Disables Built-in SCSI Port	No	Yes	Yes
Multiple Macintosh Support	Yes	No	No
Supports SCSI-2 and 16 Bit SCSI	Yes	No	No
Synchronous Data Transfers	Yes	No	No
Supports Transfers to 4.4 MBytes/s	Yes	No	No
Includes Hard Disk Utility Software	Yes	No	No
On-Board DMA Support	Yes	Yes	No
Shipped With a Matched Hard Disk	Yes	No	No
System 7.0 Compatible	Yes	Yes	Yes
A/UX 2.0 Hard Disk Partitioning	Yes	No	No
Supports Spliced/Overlapped Seeks	Yes	No	No
Supports Synchronized Spindles	Yes	No	No

NuPORT is Sold Only With Matched Hard Disk Drives.

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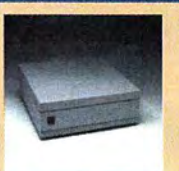
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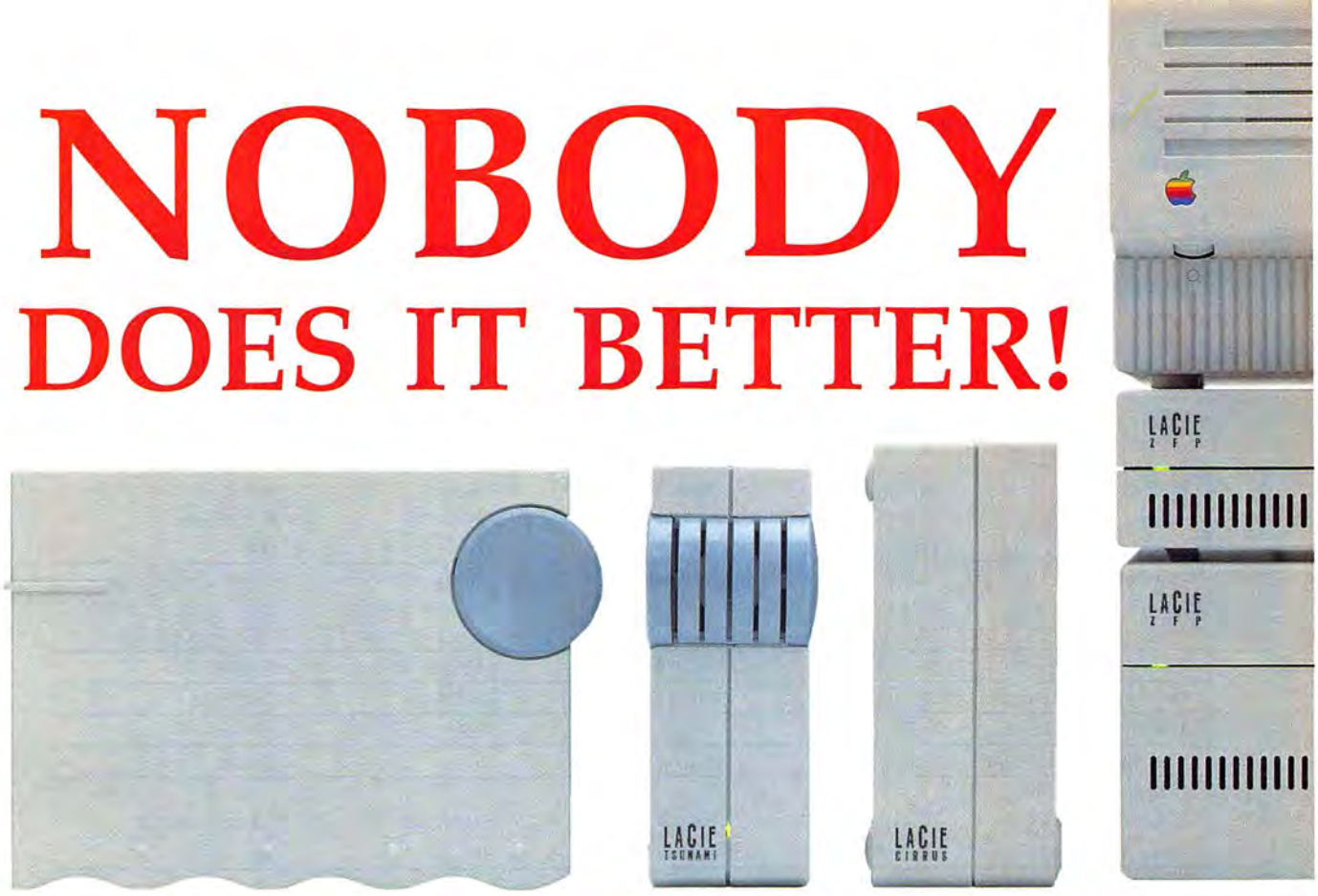
Table 2: Features of Big, Fast Hard-Disk Drives, continued

● = yes ○ = no	 **iDS** **VPS340** 𝄞𝄞𝄞½	 **La Cie** **ZFP 400** 𝄞𝄞𝄞𝄞𝄞	 **MacProducts** **Magic 380** 𝄞𝄞½	 **MicroNet** **MS-404** 𝄞𝄞𝄞𝄞𝄞
Comments	Average seek times and throughput. Small case.	Inexpensive. Average seek times. High throughput. Good software and support.	Least expensive. Average seek times. Lowest through-put. Switched power center.	Average seek times. High throughput. Extremely well built.
Price (list/street)	$2,995/$2,295	$1,999/$1,999	$1,395/$1,395	$3,795/$2,850
Capacity (advertised/actual)	341/330 MB	400/423 MB	325/325 MB	423/423 MB
Seek time (advertised/actual)	14/16 ms	15/15 ms	18/18 ms	15/15 ms
DiskBasher! results (seconds)	20.5 sec	14.5 sec	24.5 sec	14.6 sec
Technology				
OEM mechanism	Micropolis 1684-07	Seagate ST2502NM	MiniScribe M93805	Seagate ST2502NM
Platters (number and size)	four 5.25-in.	four 5.25-in.	eight 5.25-in.	four 5.25-in.
SCSI				
ID selector	push button	push button	software	push button
Termination	externally switchable	internal	internal	internal
Cable (length, type)	2 feet, 50/25-pin	2 feet, 50/25-pin	6 feet, 25/25-pin	3 feet, 50/25-pin
Software				
Bundled	proprietary, 10 MB public-domain	Silverlining, Norton Utilities, 5 MB public-domain	proprietary, Disk Manager Mac, 10 MB public-domain	proprietary
User-selectable interleave	●	●	●	●
Partitioning	○	●	●	●*
Password protection	●	●	●	●
Data encryption	●	○	○	○
Disk optimizer	○	●	○	○
Backup	●	○	●	○
File recovery	●	●	○	○
Print spooler	○	○	○	○
Case				
Fan	●	●	●	●
Indicator lights	access, power	access, power	access, power	access, power
Size (L x W x H, in.)	9.75 x 9.75 x 2†	10 x 9.75 x 2.5†	11 x 10.25 x 3.5†	10.5 x 10 x 3†
Weight	6.25 lb	8 lb	12 lb	9.5 lb
Construction	plastic	metal	metal	metal
Fuse	internal	external	internal	internal
	iDS Systems, Inc. 2107 N. First St., Suite 280 San Jose, CA 95131 (800) 733-0078 (408) 441-0500	La Cie Ltd. 19552 S.W. 90th Ct. Tualatin, OR 97062 (800) 999-0143 (503) 691-0771	MacProducts USA 8303 Mopac Expwy., Suite E Austin, TX 78759 (800) 622-3475 (512) 343-9441	MicroNet Technology 20 Mason Irvine, CA 92718 (714) 837-6033

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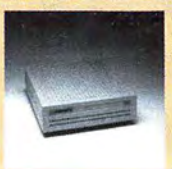
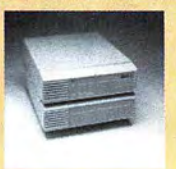
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Table 2: Features of Big, Fast Hard-Disk Drives, continued

● = yes ○ = no	 **Microtech** **N320** ŧŧŧŧ	 **Mirror** **MP290** ŧŧŧ½	 **Optima** **MiniPak 310** ŧŧŧŧ	 **PLI** **PL 320F Turbo** ŧŧŧŧ
Comments	Average seek times and throughput. Small case. Good software and support.	Slow seek times. Low throughput. Large case.	Most expensive. Slowest seek times. Smallest case. Good software.	Expensive. Fastest seek times. Average throughput. Large case. Good support.
Price (list/street)	$2,299/$1,950	$1,757/$1,757	$4,395/$3,300	$4,395/$3,075
Capacity (advertised/actual)	320/330 MB	290/291 MB	306/311 MB	320/320 MB
Seek time (advertised/actual)	14/16 ms	16.5/19 ms	12.5/25 ms	12/12 ms
DiskBasher! results (seconds)	21.7 sec	21.4 sec	16.8 sec	17.5 sec
Technology				
OEM mechanism	Micropolis 1684-07	Seagate ST4350NM	IBM 0661371	Seagate ST4385NM
Platters (number and size)	four 5.25-in.	five 5.25-in.	eight 3.5-in.	eight 5.25-in.
SCSI				
ID selector	push button	DIP switch	push button	rotary switch
Termination	internal	internal	external	externally switchable
Cable (length, type)	2.5 feet, 50/25-pin	2.5 feet, 50/25-pin	2.5 feet, 50/25-pin	2 feet, 50/25-pin
Software				
Bundled	proprietary, Total Recall, Norton Utilities, 2 MB public-domain	proprietary, CE Software utilities, 11 MB public-domain	proprietary, SUM II	proprietary, 15 MB public-domain
User-selectable interleave	●	●	●	●
Partitioning	●*	○	●*	●*
Password protection	○	○	●	○
Data encryption	○	○	●	○
Disk optimizer	●	○	●	●
Backup	●	●	●	●
File recovery	●	○	●	○
Print spooler	○	○	○	●
Case				
Fan	●	●	●	●
Indicator lights	access, power	access, power	access, power, termination	access
Size (L x W x H, in.)	10.5 x 9.75 x 2.25†	12 x 7.75 x 6.5	7.75 x 6.25 x 2.5	11.5 x 9.75 x 5†
Weight	8.5 lb	17 lb	4 lb	12.5 lb
Construction	plastic	metal	plastic	metal
Fuse	external	internal	external	external
	Microtech International, Inc. 158 Commerce St. East Haven, CT 06512 (800) 325-1895 (203) 468-6223	Mirror Technologies 2644 Patton Rd. Roseville, MN 55113 (800) 654-5294 (612) 633-4450	Optima Technology 17526 Von Karman Irvine, CA 92714 (714) 476-0515	Peripheral Land, Inc. 47421 Bayside Pkwy. Fremont, CA 94538 (800) 288-8754 (415) 657-2211

*Supports A/UX partitioning.

†Zero footprint on one-piece Mac

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For a complete list of features and specifications, or the name of your nearest dealer, call 1-800-873-4384.

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Table 2: Features of Big, Fast Hard-Disk Drives, continued

● = yes ○ = no	 **Procom** **MD 320** $$$$	 **RACET** **SA350** $$$$	 **Relax** **Hard 300 Plus** $$$	 **Rodime Systems** **Cobra 330e** $$$$
Comments	Fast seek times. High throughput.	Fastest seek times. Average throughput. Large case.	Average seek times and throughput. Switched power center.	Slow seek times. Average throughput. Two AC outlets on back.
Price (list/street)	$3,295/$3,295	$3,115/$3,115	$2,679/$2,679	$3,999/$2,500
Capacity (advertised/actual)	320/323 MB	350/349 MB	288/291 MB	330/345 MB
Seek time (advertised/actual)	13/13 ms	12/12 ms	16.5/18 ms	16/19 ms
DiskBasher! results (seconds)	15.2 sec	18.4 sec	20.9 sec	18.1 sec
Technology				
OEM mechanism	Seagate ST2383NM	Siemens Megafile 5421	Seagate ST4350NM	Maxtor XT-83805
Platters (number and size)	four 5.25-in.	four 5.25-in.	five 5.25-in.	five 5.25-in.
SCSI				
ID selector	rotary switch	push button	push button, software	push button
Termination	externally switchable	external	external	internal
Cable (length, type)	2.5 feet, 25/25-pin	1.5 feet, 50/25-pin	1.5 feet, 50/25-pin	2 feet, 50/25-pin
Software				
Bundled	proprietary	proprietary	proprietary	proprietary, Fastback II
User-selectable interleave	●	○	●	●
Partitioning	●*	○	○	●*
Password protection	●	○	○	●
Data encryption	○	○	○	○
Disk optimizer	○	○	○	○
Backup	○	○	●	●
File recovery	○	○	○	○
Print spooler	○	○	○	○
Case				
Fan	●	●	●	●
Indicator lights	access, power	access	access, power	access, power
Size (L x W x H, in.)	10.5 x 9.75 x 2.5†	15.5 x 7 x 5.5	11 x 10.5 x 3.75†	14.5 x 7 x 4
Weight (pounds)	7.5 lb	15 lb	12.5 lb	12 lb
Construction	plastic	metal	metal	metal
Fuse	internal	external	internal	internal
	Procom Technology, Inc. 200 McCormick Ave. Costa Mesa, CA 92626 (714) 549-9449	RACET computes Ltd. 3150 E. Birch St. Brea, CA 92621 (714) 579-1725	Relax Technology 3101 Whipple Rd., Suite 22 Union City, CA 94587 (415) 471-6112	Rodime Systems, Inc. 901 Broken Sound Pkwy. N.W. Boca Raton, FL 33487 (800) 688-9390 (407) 994-5585

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Table 2: Features of Big, Fast Hard-Disk Drives

● = yes ○ = no	 **Storage Dimensions 325-S1** $$$$$	 **SuperMac DataFrame XP330** $$$½
Comments	Fast seek times. Highest throughput. Large case prewired for second drive.	Slow seek times Average throughput. Good software.
Price (list/street)	$3,499/$2,300	$3,599/$2,799
Capacity (advertised/actual)	325/326 MB	330/322 MB
Seek time (advertised/actual)	13/13 ms	17.5/19 ms
DiskBasher! results (seconds)	14.5 sec	19.9 sec
Technology		
OEM mechanism	Seagate ST2383NM	Seagate ST4376NM
Platters (number and size)	four 5.25-in.	five 5.25-in.
SCSI		
ID selector	rotary switch	software
Termination	external	internal
Cable (length, type)	3 feet, 50/25-pin	2 feet, 50/25-pin
Software		
Bundled	proprietary, MacTools Deluxe	proprietary, DiskFit, SuperLaserSpool, SuperSpool
User-selectable interleave	●	○
Partitioning	●*	●
Password protection	●	●
Data encryption	○	●
Disk optimizer	●	○
Backup	●	●
File recovery	●	○
Print spooler	○	●
Case		
Fan	●	●
Indicator lights	access, power	access, power
Size (L x W x H, in.)	14.5 x 7.5 x 5.75	9.5 x 5 x 8
Weight	12 lb	12.5 lb
Construction	plastic	metal
Fuse	external	internal
	Storage Dimensions, Inc. 2145 Hamilton Ave. San Jose, CA 95125 (408) 879-0300	SuperMac Technology 485 Potrero Ave. Sunnyvale, CA 94086 (800) 624-8999, ext. 210 (408) 245-2202

*Supports A/UX partitioning.

Criteria

Price — The list price is the manufacturer's suggested retail price. The street price is an average actual price charged by dealers around the U.S. in August 1990.

Capacity — The advertised capacity of a drive typically differs from the actual formatted capacity — that is, useful storage space. The actual capacity listed is that reported by the Finder.

Seek time — Seek time is the theoretical average time required for a read/write head to move across one-third of the drive's tracks, as reported by the manufacturer. The actual seek time is as reported by our SCSI Evaluator testing. The lower the rating, the faster the drive.

DiskBasher! results — DiskBasher! is a benchmark test developed by MacUser Labs that simulates real-world drive performance during typical read and write operations. The lower the time, the faster the drive.

OEM mechanism — The OEM model name of the disk mechanism used in the drive. Check with the vendor to see if it varies the mechanism.

Platters — The number and size of the magnetic-media disks inside the drive.

ID selector — How do you change the SCSI ID number? Options include software or a thumb wheel, push button, DIP switch, or rotary switch.

Termination — Is the drive's termination inside the case or outside, using a terminator block or switch?

Cable — The length of the SCSI cable and the types of connectors on each end.

Bundled software — Software developed exclusively for a vendor's hard-disk drives is listed as proprietary, and bundled commercial applications are listed separately by name.

User-selectable interleave — Can you specify the desired interleave ratio for the drive?

Partitioning — Does the drive come with the ability to divide one large physical drive into several smaller logical drives, with each one appearing on the desktop individually?

Password protection — Does the drive come with a method of preventing others from accessing it without the appropriate password?

Data encryption — Does the drive come with a method of scrambling its contents to prevent others from accessing the data without the appropriate password?

Disk optimizer — Does the drive come with a utility for reorganizing its contents into contiguous blocks, thereby improving performance?

Backup — Does the drive come with software that copies files from the hard drive to another medium for safekeeping?

File recovery — Does the drive come with a utility for rescuing deleted and damaged files?

Print spooler — Does the drive come with a utility that takes care of printing in the background so that you can continue with your work?

Fan — Does the drive contain a fan?

Indicator lights — What do the lights on the front of the drive indicate?

Size — The dimensions of the case, rounded to the nearest quarter inch.

Weight — The weight of the case, rounded to the nearest quarter pound.

Construction — The primary material from which the case is manufactured.

Fuse — Is the drive internally or externally fused?

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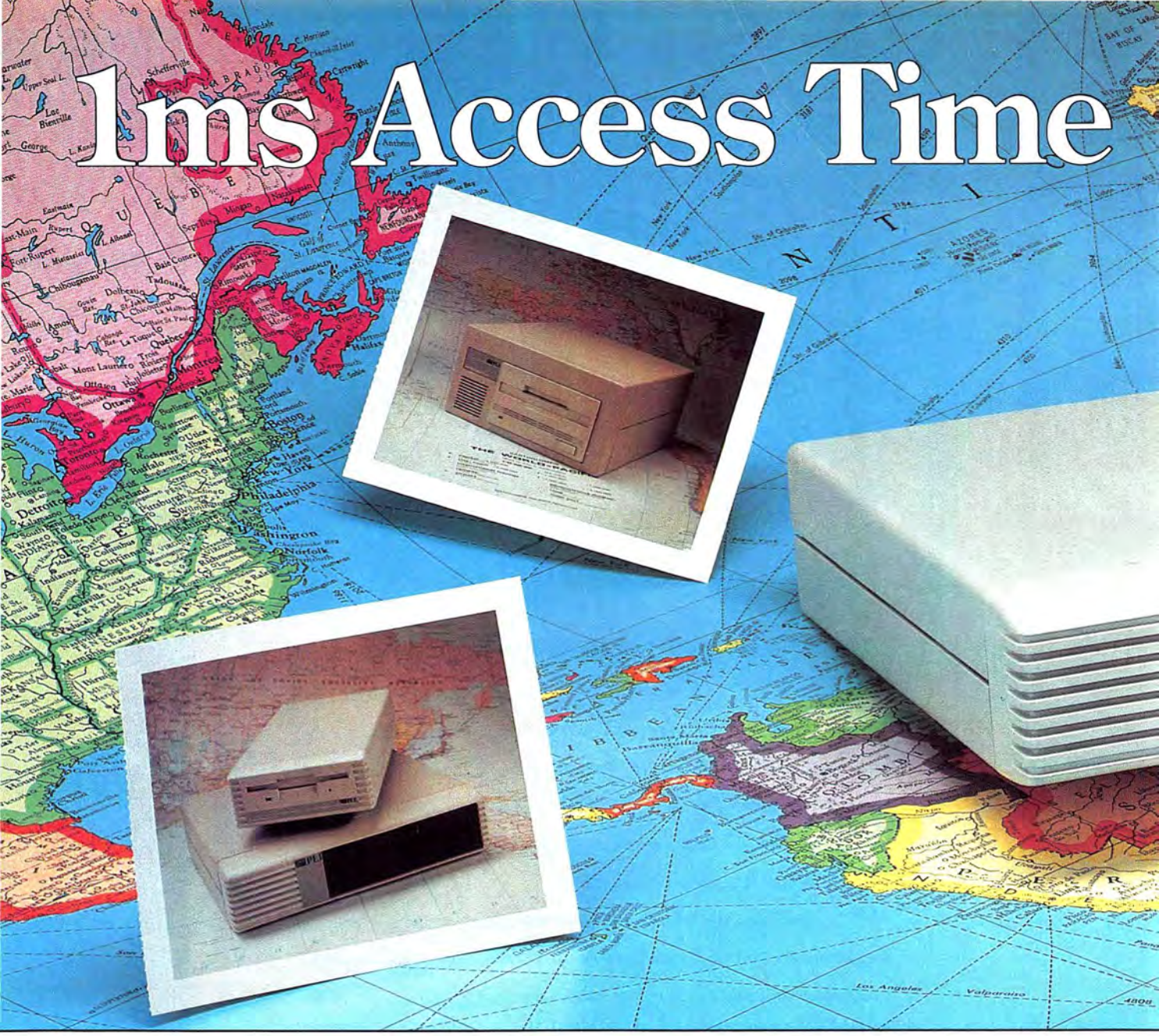
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DOSFloppy

The new DOSFloppy from PLI is a SCSI floppy drive which offers both 360k and 1.2MB disk formats with a single Macintosh drive. Other manufacturers require you to buy two separate drives to fulfill those needs. DOSFloppy is fully daisy-chainable and features external SCSI address and termination switching. AccessPC from Insignia Solutions is bundled, free, with the drive. AccessPC is a CDEV/INITwhich causes MS/DOS diskettes to mount on the Desktop, just as if they were Macintosh disks. The files can be opened by double-clicking or copied by dragging in the Finder.

SuperFloppy

The SuperFloppy and TurboFloppy 1.4 are SCSI floppy drives for the Mac, which provide 1.44MB Mac and DOS and 720k DOS diskette compatibility. The SuperFloppy offers the added benefits of 400k and 800k Macintosh compatibility. Both drives are fully compatible with AccessPC and SoftPC from Insignia Solutions. They are also compatible with all of the popular file translation software. This means that, under DOS emulation on your Mac, the floppies will act like DOS drives, and in the Mac's Finder, DOS floppies mount on the Desktop. The drives feature external SCSI ID and termination switches, and auto-eject.



Infinity 40 Turbo

The Infinity 40 Turbo uses removable 44 MB cartridges for convenience and virtually limitless storage potential. It is also extremely fast, with a 20ms access time. The Infinity 40 works on all SCSI Macs and IBM PC AT, XT, PS/2 and compatible computers. MS/DOS files may be accessed on the Mac with our DOSTransfer utility. Bundled free with each (non economy) Infinity 40 for the Mac is Casady and Greene's A.M.E. , the most complete software security package available for the Mac and a $279 value.

Optical Drive

Rewritable magneto-optical drives are becoming more and more accepted as storage solutions for the typical user. The drives offer high-capacity, low cost per megabyte and data integrity far superior to that of conventional magnetic media. They are also surprisingly fast. PLI offers three attractive optical solutions. The familiar single drive Infinity Optical (600MB), the Jukebox Jr. (6.5 Gigabytes) and the Infinity Optical Jukebox (36 Gigabytes). We will work with you to provide the solution you need.

CD ROM Drive

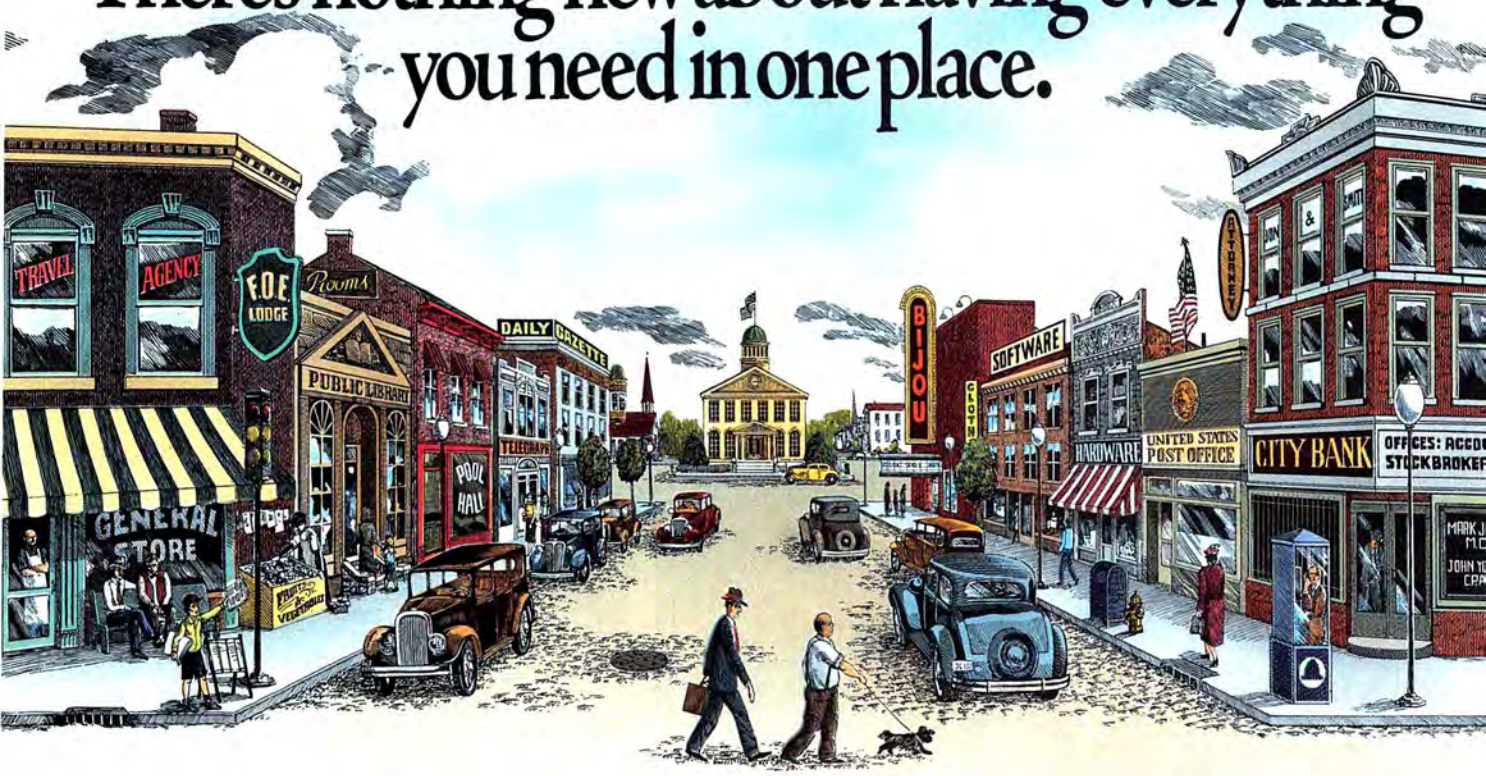
The PL CD-ROM is based on a new, 380ms Sony mechanism. It features a self-cleaning objective lens, audio output through a 1/8" headphone jack and two RCA jacks, full volume control, and external termination and SCSI ID switches. The software supports HyperCard audio XCMDs and multiple volume CD-ROM discs. Also included is a DA, Music Box, which allows the playing and full control of audio CDs in the background.

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THE MacUser 100

100

insanely great, useful, sometimes weird, even tacky

Products

that are often incredibly cheap, even free, but always

Under $250

By
Victoria von Biel
with Howard Bornstein, Ben Templin, Bruce Mewhinney, and Aileen Abernathy

Most of the year, MacUser *concentrates on business-oriented products: word processors, spreadsheet programs, hard-disk drives, printers, and so on. But all work and no play is, well, boring. To liven things up — and help you shop for the Macophile on your list — we rounded up more than 100 products guaranteed to be entertaining, practical, or just plain strange, and each one costs less than $250. The choices range from tried-and-true utilities to off-the-wall accessories, from shareware classics to Mac-assisted classical music. To round out the list, we solicited ideas from contributing editors Guy* The Macintosh Way *Kawasaki and Bob* Dr. Macintosh *LeVitus. Finally, Steven Bobker, who reviewed hundreds of products in Bobker's Dozen during 1990, reveals his favorites.*

If you have the urge to splurge on a certain someone — including yourself — you're sure to find inspiration in the MacUser *100. For still more ideas, see this issue's MiniFinders, which contains synopses of previously reviewed products in the categories of education, entertainment, hardware and accessories, multimedia, music, organizational tools, and utilities.*

THE MacUser

100

General Interest



Art Importer

This nifty program lets you turn EPS and PICT images into PostScript-font characters. Your favorite logos, clip art, signatures, and other graphics are suddenly just a keystroke away, and you can resize images merely by changing the point size. Creating a font is incredibly simple: Just import images to the desired keys, and save the new font. You can have 256 characters per font, including color images. $179. Altsys Corp., 720 Avenue F, Suite 109, Plano, TX 75074; (214) 424-4888.

BannerMania

As the name suggests, this program lets you create eye-catching banners for any occasion — with nary a jaggy in sight. You can use BannerMania's 50 banner templates, or you can start from scratch with the program's various fonts, shapes, and special effects. If you don't like the 19 bundled fonts, you can use any Type 1 font. When completed, your supersized messages print smoothly in color or black-and-white. $59.95. Brøderbund Software, 14 Paul Drive, San Rafael, CA 94903; (800) 521-6263.

Calculator Construction Set

The Mac's standard Calculator DA seems awfully limiting to anyone who's used a full-featured electronic desk calculator. Beefier calculators are available as shareware, but did you ever wish you could create the ideal on-screen calculator for your specific needs? Calculator Construction Set 2.0 lets you do just that. This nerd's delight comes with several prebuilt calculators, and you can create your own from scratch. By choosing the appropriate keys, functions, and programming, you can simulate anything from a basic adding machine to the supersophisticated HP 41C. You can save the finished product as either a DA or an application. This is no lightweight program — you need a solid understanding of math concepts if you plan to get truly creative, but the results can be worth the effort. $89.95. Dubl-Click Software, 9316 Deering Avenue, Chatsworth, CA 91311; (818) 700-9525.

CD Companion Series: Beethoven's Ninth Symphony
Audio Notes Series: Mozart's The Magic Flute



If you have a CD-ROM player, you can turn your Mac into the ultimate set of liner notes with one of these HyperCard-based series from Voyager or Warner New Media. Both companies have taken compact-disc audio and combined it with a little multimedia magic to produce recordings that are as entertaining as they are informative. Voyager's first release was Beethoven's Ninth Symphony; Warner New Media debuted with Mozart's The Magic Flute. At press time, Voyager's follow-up, Stravinsky's Rite of Spring, was awaiting the release of HyperCard 2.0. Warner New Media was expecting its second release, the Beethoven String Quartet No. 14 in C, Op. 131, by midautumn.

With their real-time commentary on the music, CD-quality audio, and sophisticated graphics, both of these series will hold the attention of anyone with an interest in music. CD Companion Series: Beethoven's Ninth Symphony, $99.95. The Voyager Co., 1351 Pacific Coast Highway, Santa Monica, CA 90401; (800) 446-2001 or (800) 443-2001 (in CA). Audio Notes Series: Mozart's

The Magic Flute, $66. Warner New Media, 3500 W. Olive Avenue, Burbank, CA 91505; (818) 955-9999.

Color MacCheese

If you're a casual artist, Color MacCheese offers you 24-bit-graphics fun at a price that's hard to beat. Resolution is limited to 72 dpi and you can save documents only in PICT2 format, but MacCheese has a nice selection of tools, including a polygon and water drop. The rake and transmogrifier — a ray-gun-shaped tool that creates texture effects — are worth the price all by themselves. If you want a professional-quality application, look elsewhere. Otherwise, say Cheese! $99. Delta Tao Software, 760 Harvard Avenue, Sunnyvale, CA 94087; (408) 730-9336. Also available from Baseline Publishing, 5100 Poplar, Suite 527, Memphis, TN 38137; (901) 682-9676.

Design Your Own Home, Interiors

Design Your Own Home, Landscape



First Abracadata released Design Your Own Home, Architecture, an object-oriented drawing program that lets you create sample floor plans and elevations from supplied templates or from scratch. Assuming you've built the house, the firm has now released two programs to complete the process: Design Your Own Home, Interiors, and Design Your Own Home, Landscape. Both packages include sample plans, and you can buy additional libraries of sample plans or region-specific plant libraries. $99.95 each; $29.95 per additional library. Abracadata, P.O. Box 2440, Eugene, OR 97402; (503) 342-3030.

DeskDraw/DeskPaint

Whether you're a dilettante or a professional artist, you'll find this drawing/painting pair hard to beat. DeskDraw creates object-oriented images, whereas DeskPaint handles bit-mapped graphics. Zedcor packages the two programs together, and each is both a full-featured application and a convenient DA. Version 3.0 adds impressive features to this classic combo's bag of tricks, including 24-bit color, full rotation, multiple windows, interchangeable color palettes, print previews, and the ability to open and save most file formats. DeskPaint also offers auto-tracing, 180 editable patterns, graduated fills, gray-scale editing, and charcoal and spray-can tools. $200. (For $399.95, you can get Desk, an integrated package of seven DAs that includes the drawing/painting programs plus DAs for telecommunications, word processing, spreadsheets and charts, database work, and appointments.) Zedcor, 4500 E. Speedway, Suite 22, Tucson, AZ 85712; (602) 881-8101.

EarthQuest

EarthQuest is an educational HyperCard stack that taps into the growing interest in global communications and the world's ecology. It has an interdisciplinary approach that combines text, maps, tables, and time lines to show how the earth's people and systems are interconnected. Four windows let users explore the earth's natural systems, human history and achievements, environment and ecosystem, and countries of the world. This isn't a dry presentation — EarthQuest uses animation, interactive games, and samples of languages and music. $79.95. EarthQuest, 125 University Avenue, Palo Alto, CA 94301; (415) 321-5838.



MacInTax

Figuring taxes is never fun, but this classic Mac program

can make filing your federal and state income-tax forms slightly less of a chore. MacInTax displays all forms, schedules, work sheets, and statements in the exact IRS format, which you can print on either an ImageWriter or a laser printer. All MacInTax forms are linked, so changes you make in one document are reflected in all others. The 1990 version of MacInTax, including updated federal and state forms, was scheduled for release around Thanksgiving. As they could last year, users who expect a refund can automate the whole process by using MacInTax to file electronically. $99. Softview, 1721 Pacific Avenue, Suite 100, Oxnard, CA 93033; (805) 385-5000.



MacRecorder

The Mac comes with a few basic digitized sounds, but some folks demand more. They want to hear their multitalented Macs sound off now and then — in imitation of a trumpeting elephant, or *Star Trek*'s Mr. Spock, or even James Brown singing "I Feel Good!" The three software components of MacRecorder let you record, manipulate, and install an infinite range of new sounds. Farallon also provides a small analog-to-digital sound converter, which can use its own built-in microphone or input from other microphones, CD or audiotape players, and VCRs. $249. Farallon Computing, 2000 Powell Street, Suite 600, Emeryville, CA 94608; (415) 596-9100.



ParaFont

This simple program is the quickest, easiest way to create custom fonts that contain fractions, small caps, and ligatures. These special characters are missing from most Mac fonts, but ParaFont lets you easily create a Type 3 font with these refinements, plus old-style

Bob's Best Buys

Which utilities does Bob LeVitus, author of Dr. Macintosh *and* Stupid Mac Tricks, *have on his supercharged Mac? Here are his five favorites, which are sure to please any discriminating Mac user. He also mentioned that if anybody wants to get him a little something, he'd be quite happy with the $500,000 UltiMac, featured in the September '90 issue*

Alarming Events

Alarming Events is a reminder program that keeps track of appointments and things to do. Appointments pop up no matter what you're doing, your to-do list is updated automatically, and there's an archive of completed tasks. This program is a must if you're a forgetful writer like me. $129.95. CE Software, P.O. Box 65580, West Des Moines, IA 50265; (515) 224-1995.

FlowFazer

FlowFazer from Todd Rundgren's Utopia Grokware is one of my all-time-favorite programs. It's yet another screen saver, but this one puts a dazzling Lava-Lamp-like display of color onto your screen. Utopia calls it "music for the eye." If you have a color Macintosh, you need FlowFazer. $49.95. Utopia Grokware, 300 Valley Street, Sausalito, CA 94965; (415) 331-0714.

On Location

If you have a hard disk, On Location is a must-have. It locates files, by filename or text in the file, at a speed that has to be seen to be believed. It then lets you view or copy text from the file without launching the parent program. Its only flaw is an ugly, nonstandard interface. Still, it's a program I'd have a hard time living without. $129.95. ON Technology, One Cambridge Center, Cambridge, MA 02142; (617) 225-2545.

QuicKeys

QuicKeys is what MacroMaker should have been. With this utility, a single keystroke lets you open a program, select a DA, make menu selections, close and resize windows, shut down, or invoke a sequence combining one or more of these features. QuicKeys 2 (which should be out by now) is simple to use yet far more powerful, intelligent, and trouble-free than Apple's MacroMaker. $149.95. CE Software, P.O. Box 65580, West Des Moines, IA 50265; (515) 224-1995.

Retrospect

This is the first gift I would give a new Mac owner, because it lets you back up your files unattended. Most people (and I include myself here) don't back up nearly often enough, but because Retrospect has a built-in timer, once you've set it up, you can just about forget it. Retrospect is trouble-free and idiotproof. $249. Dantz Development, 1510 Walnut Street, Berkeley, CA 94709; (415) 849-0293.



numerals or superscript characters. ParaFont creates new PostScript fonts from existing ones, and it can slant, expand, compress, or scale existing font characters. You can even mix and match characters from several different fonts for a unique look. Note: ParaFont creates Type 3 fonts, which are not compatible with ATM (Adobe Type Manager). $99. Design Science, 6475-B E. Pacific Coast Highway, Suite 392, Long Beach, CA 90803; (213) 433-0685.



SwivelArt

Tired of 2-D clip art? Then check out SwivelArt. This package of slick, sophisticated 3-D graphics includes 10 fonts and 100 images of equipment, maps, dingbats, and symbols. Using the bundled run-time version of Swivel 3D, you can change the orientation, illumination, perspective, color, and size of the images and then export the finished artwork to other applications in the standard Mac file formats. $129.95. Paracomp, 1725 Montgomery Street, Second Floor, San Francisco, CA 94133; (415) 956-4091.

The Talking Moose

One of the most famous Mac novelties, The Talking Moose was originally a shareware offering. Version 3.0, just released commercially by Baseline Publishing, is a full-color animated DA that pops up on your screen at odd moments and says the darnedest things. (The Moose requires Macintalk.) You can choose how often the moose speaks, what he says, and how he says it (he has an interesting Toronto-by-way-of-Neptune accent). This is one of the few Mac gimmicks that doesn't get old quickly. $39.95. Baseline Publishing, 5100 Poplar, Suite 527, Memphis, TN 38137; (901) 682-9676.



WillMaker

Drawing up a will is serious business, and if you've been putting this task off, take a look at WillMaker. This program is a simple and thorough way of writing the will you want, and Nolo Press has updated it to include recent changes in the law. WillMaker 4.0 offers more ways to make bequests, provides easier procedures for writing a simple will, and lets you export your will as a word-processing document for custom formatting. WillMaker also provides — on a state-specific basis — the new options for leaving property to children offered by the UTMA (Uniform Transfers to Minors Act). The manual covers the legal concepts of drawing up a will in plain English, and it gives plenty of choices and examples to help you decide what to do with your worldly possessions. $69.95. Nolo Press, 950 Parker Street, Berkeley, CA 94710; (800) 992-6656 or (415) 549-1976.

Utilities

Address Book Plus

This little application keeps track of names, addresses, and phone numbers and lets you print lists in a variety of formats: mailing labels, envelopes, Rolodex cards, simple phone lists, or address-book pages. You can't customize the predetermined data-entry screen, but there are enough fields and methods of sorting your data to fill most needs and you can use pop-up menus to automate some data collection. Version 2.0, which should be shipping when you read this, adds double-sided printing, extra fields, and the ability to edit entries from a DA. $89.95, or $129.95 with leather binder.

Power Up Software, 2929 Campus Drive, San Mateo, CA 94403; (415) 345-5900.

Adobe Type Manager



If you don't have ATM by now, you should. This ubiquitous utility practically eliminates jagged text on-screen and on paper. It produces sharp, smooth screen displays of PostScript Type 1 fonts at any point size, and it improves the output quality of fonts on non-PostScript printers such as the DeskWriter and ImageWriter. Version 2.0 (just released) is significantly faster than its predecessor. $99. Adobe Systems, 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039; (800) 447-3577 or (415) 961-4400.

After Dark

Protector Shark



The latest Mac gimmick seems to be silly screen savers. Screen savers do have a serious purpose — protecting your screen from phosphor burn-in — but you'd never know it from the bizarre images and ridiculous sounds that erupt from your Mac. After Dark is a classic screen saver, and the latest revision includes 30 modules (many of them new), sound effects (which you can turn off, thankfully), and programmability. Berkeley Systems bills After Dark 2.0 as "the ultimate screen-saver collection," a bit of hyperbole that is probably warranted by the Satori, Fish!, and Flying Toasters modules alone. $39.95. Berkeley Systems, 1700 Shattuck Avenue, Berkeley CA 94709; (415) 540-5535.

Protector Shark is a screen saver that doubles as a game. When your screen blacks out, a bunch of sharks and little men with harpoons chase each other around the screen. By pressing the space key, you can fire spears from a diver's harpoon. He gets a point if he hits the shark; if the shark escapes and eats the diver, the shark gets a point. Protector Shark also includes a rubber shark fin to perch on your Mac and SoundMaster files with shark music and screams. $49.95. Ibis Software, 90 New Montgomery Street, Suite 820, San Francisco, CA 94105; (415) 546-1917.

ClickChange



Customizing your Mac's sounds and desktop appearance is a great way to express yourself, but it usually means cluttering up your System Folder with INITS and cdevs or mastering ResEdit. ClickChange is an all-in-one package that lets you customize the Mac's buttons, color, cursors, scroll bars, sounds, and windows. You can add 3-D buttons and windows; change the color of buttons, menus, and windows; and replace the five standard cursors. ClickChange isn't just for fun — the ability to customize scroll bars can be a big benefit to anyone using a large monitor. $79.95. Dubl-Click Software, 9316 Deering Avenue, Chatsworth, CA 91311; (818) 700-9525.

Compactor

This new compression utility is slick. StuffIt may reign as the compression king on most on-line services, but Compactor can compress files as SEAs (self-extracting archives) — something the shareware version of StuffIt can't do. You don't need Compactor in order to decompress one of its compressed SEA files. You just double-click on a Compactor SEA, and it unfolds automatically —

Guy's Gift List

The only Mac gift Guy Kawasaki wants is a Mac Plus — strapped into the back seat of a Porsche 911 Carrera/4 with four-wheel drive, ABS brakes, 247 bhp at 6,100 rpm, and a Macintosh interface. List price (1-megabyte version): $70,000. His picks for the rest of us include the new paperback version of The Macintosh Way (HarperCollins, $9.95) *plus:*

KiwiEnvelopes

All you do with this envelope-addressing DA is copy the name and address from your letter to the Clipboard, launch the DA, and feed your envelope into the printer. It even prints postal bar codes. $49.95. Kiwi Software, 6546 Pardall Road, Santa Barbara, CA 93117; (805) 685-4031.

QuickDex

This simple DA is a database/electronic Rolodex that's a slam dunk to use. It's a little limited in features, but sometimes less is more. What's a field? What's a report? Who cares? $60. Casady & Greene, P.O. Box 223779, Carmel, CA 93922; (408) 624-8716.

Real World PageMaker 4

The inexorable thunder lizard's guide to PageMaker 4.0 by Olav Kvern and Steve Roth, the two guys who know it best. If you know more than this book, you should write one. $24.95. Bantam Computer Books, 666 Fifth Avenue, New York, NY 10103; (212) 765-6500.

StickyBusiness

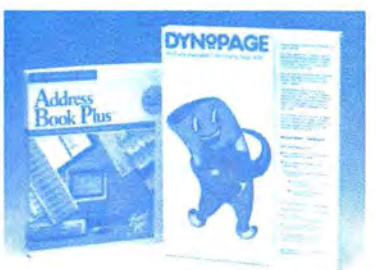
Label, card, and tag templates for the rest of us. I use only the Avery 5260 template, so I can't claim to be a power user of this product. Just the ability to pick from a wide variety of default labels is enough to make me recommend it, however. $179.95. Williams & Macias, S. 3707 Godfrey Blvd., Spokane, WA 99204; (509) 458-6312.



User-Group Membership

Membership in a user group gives you support and inside information. My favorite is BMUG (Berkeley Macintosh Users Group), which you should join for the newsletter alone. It's thick, irreverent, emotional, and often accurate. Plus you get to say you're a member of BMUG — enough to impress some people. Yearly subscription to BMUG, $40. 1442A Walnut Street, #62, Berkeley, CA 94709; (415) 849-9114.

no muss, no fuss. SEAs always add a little bit of code to the compressed archive, but a Compactor SEA is still smaller than a normal StuffIt archive. Zmac (the on-line service for *MacUser*) has adopted Compactor SEAs as the standard for large files posted in the Download Forum, and other on-line services are following suit. Compactor's shareware fee is $25; you can get a copy from your local user group or an on-line service such as Zmac.



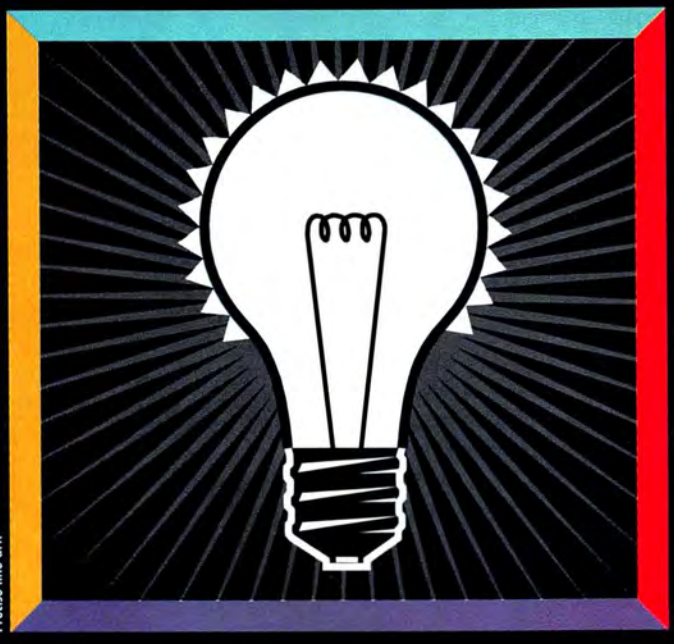
DynoPage Dynodex

With DynoPage, you can print *any* file as double-sided pages. This specialized print driver — accessed through the Control Panel instead of the Chooser — also lets you print custom page sizes, thumbnails of multipage documents, and pages for a personal organizer. DynoPage is a spin-off from Dynodex, an address-book utility similar to Address Book Plus that also can print on one or both sides of address-book or personal-organizer pages. A substantially upgraded version of Dynodex should be available by now. $99.95 each. Portfolio Systems, 21 E. Market Street, Rhinebeck, NY 12572; (800) 729-3966.

HandOff II

This extremely useful utility solves the annoying problem of not being able to open a file because you don't have the creating application. It lets you specify, for example, that Word should open all documents created by MacWrite. HandOff II is also a full-fledged file launcher similar to On Cue. Besides allowing you to launch any application from a pop-up menu, HandOff lets you set the color depth and sound level to be used when launching specific applications, and it enables you to group related files into "briefcases" that can be easily accessed from HandOff's menu. $79.95. Software Innovations, P.O. Box 811, Allen, TX 75002; (214) 727-2329.

How Many Progr
To Change A



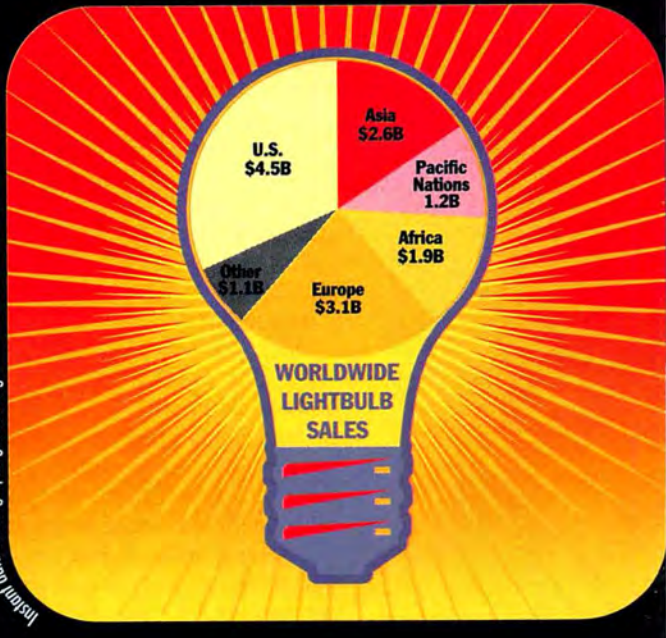
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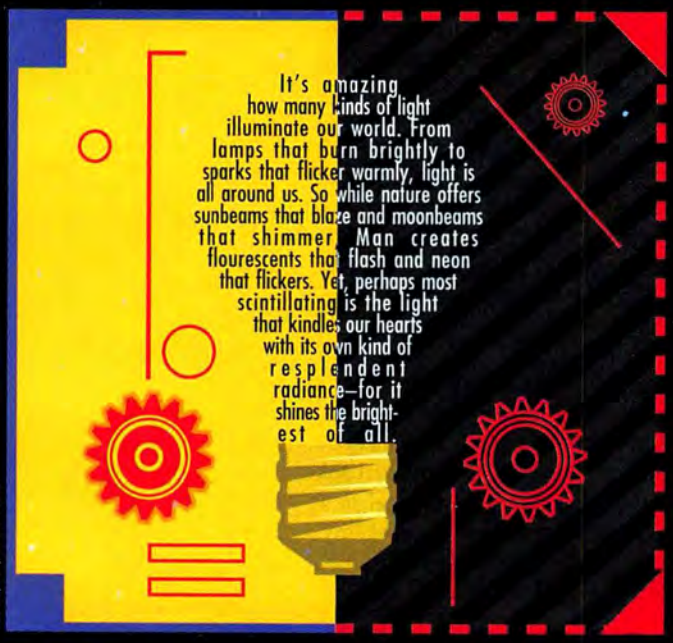


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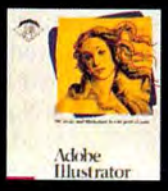
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HyperHIT

HyperCard isn't the world's fastest database application (Apple never said it was). However, it *does* offer an infinitely flexible interface and thorough control over both text and numeric data. For those who are proficient with HyperTalk scripts and the use of XFCNs and XCMDs, HyperHIT 3.0 provides a powerful selection of these external software tools. With them you can mimic high-level programming, and your customized database stacks can always export their data (as comma-delimited text, for example) for later use in a more powerful application. $195. SoftStream International, 19 White Chapel Drive, Mount Laurel, NJ 08054; (609) 866-1187.

HyperTools



This two-package HyperCard tool kit offers sophisticated controls over the usual variables such as button icons, field properties, and cursors. More-elaborate tools handle fonts, object alignment, scripts, sounds, precise graphics, and limited animation. There are also developer-level tools for revealing hidden objects, stack structures, and resources and for defining sorts and formatting data. HyperTools 2.0 supports all incarnations of HyperCard, from the first release to the long-awaited version 2.0. Packages 1 and 2, $99.95 each. Trendware Corp., P.O. Box 2285, Huntington, CT 06484; (203) 926-1116.

MultiClip

MultiClip is a handy utility that lets you expand the Mac's Scrapbook and Clipboard capabilities, most notably by letting you save more than one item on the Clipboard at a time. It also lets you save multiple Clipboards (which MultiClip calls ClipFrames), back them up, and edit your clippings. Version 2.0 adds several new features, including pop-up menus of ClipFrames, a search capability, and the ability to print thumbnails of ClipFrames. $129. Olduvai, 7520 Red Road, Suite A, South Miami, FL 33143; (305) 665-4665.

Norton Utilities for the Macintosh
SUM II



Peter Norton Computing, one of the more creative PC software developers, introduced its Norton Utilities for the Macintosh in mid-1990. Mac users anticipated a head-to-head battle between Norton and the popular SUM (Symantec Utilities for Macintosh) — but Symantec liked Norton's package so much that it bought the company! Now SUM II and Norton Utilities are both available from Symantec. Both packages can diagnose and repair disk errors, recover (most) lost or erased files, and defragment files and optimize disk performance. SUM II and Norton Utilities perform these tasks somewhat differently; SUM has a more established track record on the Mac, but a fair number of Mac aficionados prefer the elegant Norton interface. Norton Utilities for the Macintosh, $129; SUM II, $149.95. Symantec, 10201 Torre Avenue, Cupertino, CA 95014; (800) 441-7234 or (408) 253-9600.

Now Utilities



Most Mac users sort through dozens of utilities before settling on the handful they actually use. Now Software has simplified your search by bundling a dozen basic utilities, most of which are destined to become handy additions to your repertoire (see review, September '90, page 105). The offering includes AlarmsClock, which displays

the time and date in the menu bar and warns of scheduled appointments; NowMenus, which controls the appearance and font styles of menus, windows, and dialog boxes; DeskPicture, which replaces desktop patterns with PICT images; Print Previewer, which provides on-screen print preview for applications that don't have it; MemorySetter and Profiler, which configure and analyze the operating system and hardware; and StartUp Manager and Persistence, which control the icons and activity of INITs and cdevs. Future releases will include the popular shareware program Boomerang (see the "Bobker's Dozen Best" sidebar). $149. Now Software, 520 S.W. Harrison Street, Suite 435, Portland, OR 97201; (503) 274-2800.

Palmtop Link
CasioLink
Message Mover



Palmtop Link and CasioLink connect the Mac to two popular electronic organizers — the Sharp Wizard and the Casio B.O.S.S. (Business Organizer Scheduling System). Palmtop Link consists of file-exchange software and cables for transferring files between your Mac and the hand-held Wizard. It includes software for data transfer and conversion, calendars, scheduling, time accounting, expense management, and phone and to-do lists. You can use Palmtop Link to create spreadsheet, HyperCard,

8 Shareware Classics

Shareware programs do their tasks without bells and whistles, and they give you a pretty good idea of what features you want in a commercial product. A range of shareware applications is available from user groups, through commercial shareware vendors, and from on-line services such as Zmac. (Look elsewhere in this issue for information on how to join Zmac.) Be sure to pay the shareware fees, which are minimal — it's really the only way to ensure a steady stream of shareware in the future.

Address Book

Address Book keeps names, addresses, and phone numbers in a clear and logical mini-database. You can export the text when you decide to upgrade to a commercial database program, but you may never want to. This easy-to-use DA has good search capabilities and even dials the phone number for you. $20.

BiPlane

BiPlane is a fully functional spreadsheet program whose spreadsheets can hold 1,000 x 1,000 cells of data. It has no macros or charting capabilities, but you can format each cell according to font, size, and style and it has more than 30 functions for building mathematical formulas. Includes a DA. $40.

Calendar DA

Calendar DA is just what it says. Choose it from the Apple menu to display a monthly calendar with space for daily appointments. When you type in an engagement, the day is highlighted on the monthly calendar. Calendar DA will be around for a long time — it has dates well into the next millennium. $10.

MacBillboard

MacBillboard is as simple as the original MacPaint, and refreshingly so. It has a paintbrush, pencil, rectangle, circle, patterns, lasso, and multiple fonts. But where it really shines is in letting you compose and print large-format paintings such as posters (hence its name). From CE Software's Don Brown. $39.95.

MiniWriter

MiniWriter is a DA for basic text editing. You can type a letter with it, but you wouldn't want to write a book. It has a standard Find button and multiple fonts, and it prints PostScript files on a LaserWriter. $12.

Moire

If you ever walk away from your computer when it's still on, then you need a screen saver to help you avoid phosphor burn-in. Moire is one of the best shareware offerings amid a crowded commercial field. Its swirling patterns give your pixels a rest while you take a break. $10.

SuperClock!

SuperClock! tells you the time by putting a digital readout into the upper right corner of your menu bar. Click on it to reveal the date; click again to get a stopwatch. Clean, elegant, unobtrusive, and free.

ZTerm

ZTerm is the most versatile of the shareware telecommunications programs that let your Mac send data through a modem. It supports several file-transfer protocols and VT100 emulation. If that isn't enough, you probably need a commercial package. If you've just bought a modem or are unsatisfied with your modem's software, give ZTerm a try. $40.

database, or other files from Wizard data or to move Mac data into Wizard programs. CasioLink connects the Mac to the Casio B.O.S.S. It includes two cables and a disk with a HyperCard stack; a phone number, address, and business-card directory; an appointment scheduler; and a memo pad that you can use with either the Mac or the B.O.S.S. Palmtop Link, $149.95; CasioLink, $109. Traveling Software, 18702 N. Creek Parkway, Bothell, WA 98011; (206) 483-8088.



Message Mover is software that enables you to transfer text and spreadsheet data to your Mac from the Atari Portfolio palmtop computer. The package includes the necessary serial cable. $149. Computer Friends, 14250 N.W. Science Park Drive, Portland, OR 97229; (800) 547-3303 or (503) 626-2291.

Partner

Partner is a handy tool for anyone who needs to integrate text and graphics. By harnessing the power of MultiFinder, this INIT lets you quickly access graphics applications while still inside another program. Once you've created or imported a graphic with Partner, you can edit it *on the page* in your favorite page-layout or word-processing program without ever returning to the creating graphics application. Partner enables you to save all your publication's components — fully editable graphics and text — in a single file, and it can place graphics files into programs that normally don't accept them. Partner works with most word-processing, page-layout, and painting programs. $99. Salient, 3101 Avalon Court, Palo Alto, CA 94306; (415) 852-9567.

Polly MacBeep

This silly-but-fun utility lets you randomize the playing of particular beeps by assigning a "weight" to each sound — the higher the weight, the more often that particular sound is played. Now you can space out how often your coworkers hear those weird sounds — such as high-pitched screams and strange animal noises — that are funny every now and then and incredibly annoying if repeated too often. You can use Polly MacBeep to steal sounds from other applications and documents (as long as they're saved as standard Mac snd resources), and it comes with a wide variety of beep replacements that should appeal to Macophiles of all ages. (A *MacUser* favorite is Marge Simpson admonishing, "Be nice!") Polly MacBeep was created by the same team that developed Color MacCheese. It's incompatible with several INITs, but because it costs only $10, you may not mind the inconvenience. Delta Tao Software, 760 Harvard Avenue, Sunnyvale, CA 94087; (408) 730-9336.



StuffIt Deluxe

If you've used an on-line service for longer than 30 minutes, chances are you've run across a few .SIT files. These ubiquitous bundles of compressed data are the work of StuffIt, a masterpiece of Mac programming. Developed primarily by Raymond Lau, the original program (still available as shareware) has become the commercial product StuffIt Deluxe.

The new version still compresses graphics, applications, and text documents into files suitable for efficient storage or faster modem transmission, but it also offers some powerful new features. An extension called Magic Menu adds StuffIt commands to the Finder's menu bar, and built-in scripting automates backups of compressed

files. StuffIt Deluxe offers password protection, handwritten electronic "signatures" for verification, and DES encryption. In case these Mac features aren't enough, the new StuffIt can decompress IBM-format ZIP and ARC files. Shareware version (StuffIt Classic 1.6), $25; StuffIt Deluxe, $99.95. Aladdin Systems, Deer Park Center, Suite 23A-171, Aptos, CA 95003; (408) 685-9175.

Type Reunion
Fontina

These two utilities can bring order to a disorganized, interminable font menu. Type Reunion alphabetizes the font menu by family name (such as Times) and places the styles and weights in submenus; it can reduce the length of your font menu by up to 75 percent. Fontina takes a different approach: It leaves all font styles on the main menu but reorganizes them so that family members appear together. In either case, you will finally be rid of that nonsensical B Palatino Bold. Type Reunion, $65. Adobe Systems, 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039; (800) 447-3577 or (415) 961-4400. Fontina, $69.95. Eastgate Systems, P.O. Box 1307, Cambridge, MA 02238; (617) 924-9044.

Hardware



Jukebox Five

Jukebox Five is an elegant solution to a simple problem — namely performing unattended floppy-disk backups or formatting multiple disks. This disk feeder attaches to the Mac floppy-disk drive and automatically loads and ejects up to 15 disks. Jukebox Five is completely self-contained: It hangs by a plate on the front of the drive and runs on AA batteries; you can also plug it in to an outlet via an adapter. It's compatible with the Mac SE, SE/30, and Mac II line. $199. Fifth Generation Systems, 10049 N. Reiger Road, Baton Rouge, LA 70809; (504) 291-7221.



LabelWriter

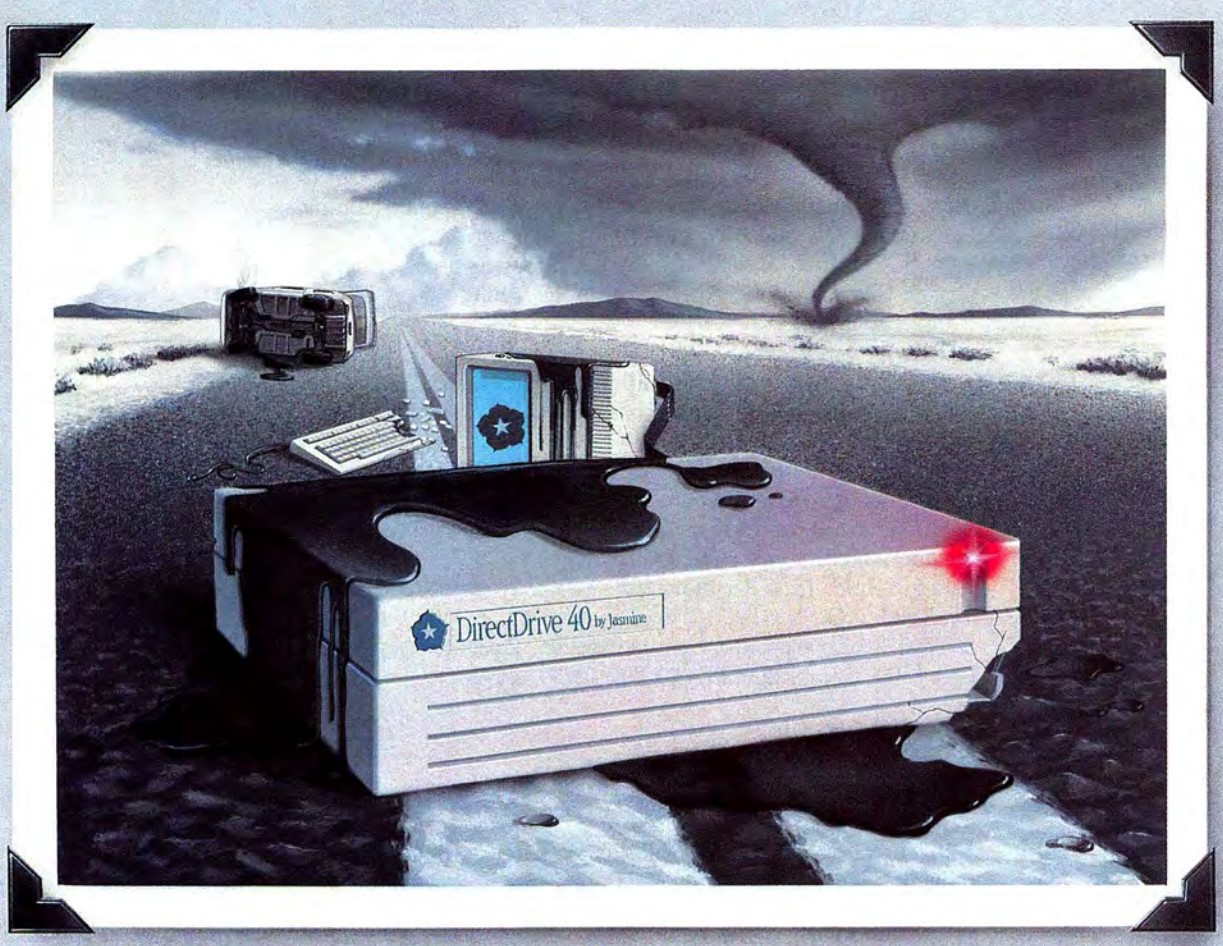
Using the Mac to address envelopes looks professional, but feeding envelopes into a laser printer can be a real nuisance. One solution is the LabelWriter, a dedicated label printer that plugs into the Mac's serial (modem) port. It lets you quickly and professionally print 1-x-3-inch address labels, and you can print to it from within any application. The LabelWriter is compact (3 x 6 inches), and it uses thermal direct printing technology — in other words, you never need to replace the toner. $249.95. CoStar Corp., 22 Bridge Street, Greenwich, CT 06830; (203) 661-9700.

MacSpeaker



As sound applications get more sophisticated, the need for high-quality sound grows. If you use CD-ROM, multimedia, or music applications, or if you just want to add a little punch to your presentations, check out MacSpeaker. This pair of speakers plugs into the Mac's sound-output jack and mounts on the side of any monitor (or you can place the speakers away from your Mac). The speakers are magnetically compensated to protect the monitor from magnetic fields that can affect its picture.

Guess Who Survived a Tornado!



Dear Jasmine Technologies,

Occasionally we win one.

On 11/15/89, as I was driving home from work, a tornado formed just to the west of me. I had enough time to pull into a safe parking lot and duck down. The "safe parking lot" turned out to be right in the path of the tornado. I was knocked out as the 200 MPH winds struck, flying my car—and me—nearly 300 yards. I woke up in the hospital with a severe concussion and blood loss. As part of the $250 million storm damage, my car was totalled and my computer was lost.

After I was released from the Hospital, my wife and I went to the Police Station where some "valuables" had been rescued from the disaster scene. There was my Macintosh SE with its Jasmine drive. The hardware was in sad shape; the front SE surface was bashed in, there was a big piece missing from the Jasmine Drive, and both were coated with a mixture of motor oil, antifreeze and water. The insurance company agreed that it was a total loss. But, realizing that the damage was finite, I began cleaning and straightening out everything. I jokingly powered up—IT WORKED! The bashed-in Jasmine drive booted the straightened out SE giving me a happy Mac, displaying the partitioned icons and sat there waiting! The clock was even right! So far, the drive has yet to fail.

I'm writing this letter (on the Jasmine drive) of appreciation to all of you in hope that you will be as pleased as I am that your products survived the forces of a major tornado that was blowing manhole covers around like frisbees. I don't have the foggiest idea where the drive ended up, but judging from all the junk coating it, it must have been found under one of the piles of destroyed cars.

In summary: the car was totalled, I was almost totalled, but the Jasmine drive made it O.K. Congratulations on making some darn good stuff. I plan to take the scarred hardware to work and continue to use it there as a reminder of one of the positive aspects of that unfortunate experience.

Sincerely,

Eugene K. Lawson

Gene Lawson

The New Jasmine...

For the last four years Jasmine has continuously been the leader in the Macintosh hard drive market. We're proud to announce that we are now a division of Chess, a dominant force in the European Macintosh market. With our new management we are producing the kinds of innovative products that we've become known for.

Look at the Service...

Jasmine's Platinum Flower Service is focused on our Customers. Over 25% of our staff is dedicated to Customer and Technical Support. Each Jasmine drive is thoroughly burned in and tested before shipping and we include informative manuals and detailed troubleshooting guides to help with any problems that may arise. If you're not satisfied with any aspect of your drive, you have 30 days* to return it for a full refund and, should your drive need help, the Platinum Flower line has a 2-year repair warranty.

Don't Take Our Word for it...



Jasmine Technologies has consistently finished first in the MacUser Labs' Buyers Guide and we've been praised in every major Macintosh publication for the quality of our drives and for the ease of use of DriveWare, our custom drive utility. Jasmine has earned more MacWorld and MacUser awards for Macintosh peripherals than all of our competitors combined.

Now, Consider the Alternatives...

Go ahead, check out the competition. We could use cheaper parts and have the same kind of "too good to be true" prices as some drive makers, but remember, if it sounds too good to be true, it probably is. We'd rather spend a little more, *not* cut the corners, and produce a premium drive at a non-premium price. We've set the standards and we will continue to lead the industry now and in the future. Simply put, there is no substitute for the best.



The Jasmine Edge...

A 70,000 hour meantime between failures. A noiseless fan with a filter. Two surge protected AC outlets and two power fuses. A SCSI select switch

DriveWare, our drive utility, provides the best SCSI partitioning, password protection, error correction, diagnostic and help software.

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80 MB	$499

Platinum Flower Line	
Capacity	**Price**
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180 MB	$969

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For international inquiries call (415) 550-2900 or FAX (415) 648-1625. Jasmine, DirectDrive and DriveWare are registered trademarks of Jasmine Technologies. All other trademarks are of their respective manufacturers.

You can use MacSpeaker with additional audio equipment such as synthesizers, CD and laser-disc players, and VCRs. $199. Monster Design, 274 Wattis Way, South San Francisco, CA 94080; (415) 871-6000.



MacTrac

Ergonomics is "in," and anything that makes working at your computer more comfortable is attracting attention. With that in mind, MicroSpeed has redesigned its trackball, MacTrac, to fit the shape of your hand. The new model has a longer, sloped design with a wrist rest, making it more comfortable to use than the standard mouse. Of course, a trackball has other advantages too, the major one being that you can use it in a confined space. The people at MicroSpeed also claim that MacTrac can help you play a mean game of Tetris. Mac Plus and 512K interface, $99; ADB interface, $119. MicroSpeed, 44000 Old Warm Springs Blvd., Fremont, CA 94538; (415) 490-1403.

MousePenMac
Cordless Mouse



MousePenMac is a stylus-type device that gives you the power of the mouse with the feel of a ballpoint pen. It's a direct mouse replacement, and it provides you with much more dexterity when doing drawing, painting, CAD, or other graphics. Because it works in a 3-inch-square space, MousePenMac is particularly useful for users of portables and anyone else whose space is limited. $129. APPOINT, 1332 Vendels Circle, Suite 101, Paso Robles, CA 93446; (800) 448-1184 or (805) 239-8976.

The Cordless Mouse removes most of the constraints of working with a mouse attached to your keyboard. Instead of using a cable, the Cordless Mouse transmits an infrared signal, and it can be operated from 5 feet away and at a 45-degree angle. $149.95. Basic Needs, 2342 Meyers Avenue, Escondido, CA 92029; (800) 633-3703 or (619) 738-7020.

Single Inline Memory Modules (SIMMs)

Does your Mac sometimes razz you with "Insufficient memory" messages? Is your System Folder so full of INITs and deep-sea screen savers that you can't load your word processor? Fortunately, plummeting SIMM prices make it easy to add RAM, as long as you're careful and follow instructions. Mac SIMMs operate at different speeds; if you buy the fastest RAM you can afford, it will probably still be useful when you move up to a faster Mac.

Dozens of vendors sell SIMMs, and prices change daily; check a publication such as *MacWEEK* for current prices. Be sure you get all the necessary installation tools and instructions. SIMM sources include MacConnection, 14 Mill Street, Marlow, NH 03456; (800) 334-4444. Microtech International, 158 Commerce Street, East Haven, CT 06512; (800) 325-1895 or (203) 468-6223. Newer Technology, 7803 E. Osie Road, Suite 105, Wichita, KS 67207; (800) 678-3726 or (316) 685-4904.



Switchboard

Switchboard is a user-configurable keyboard comprising independent modules that you can rearrange or change to suit your needs and the computer you're working on. It's engineered to work with Macs and with the IBM PC XT, PC/AT, PS/2, and compatibles. The

basic Switchboard has a 105-key layout with removable numeric, cursor, and alphabet keypads that can be repositioned into six different layouts. A trackball module is available at additional cost; other modules should be out by the time you read this. $239.95; trackball, $149. Datadesk International, 9314 Eton Avenue, Chatsworth, CA 91311; (818) 998-4200.

The Tandy Connection

Do you covet a portable? Have you stopped yourself from buying Tandy's inexpensive 102 laptop ($350) or WP-2 word processor ($600) because of concerns about Mac compatibility? Fret no more. Cabochon's 100duet and WPduet interface kits let you upload and download files (with formatting intact) between Tandy portables and the Mac. The interface kits include a cable that connects to the RS-232C port on your Tandy and to the older DB9 or newer mini-8 male connection port on the Mac; an adapter for use with the Tandy Portable Disk Drive; and a word-processing, file-transfer, and translator program for your Mac that supports formats such as MacWrite II, WriteNow, and RTF. *This* is the portable kit for the rest of us. $99.95. Cabochon, 1740 Massachusetts Avenue, Boxborough, MA 01719; (508) 264-4648.



WristMac

There are lots of ways to turn your Mac into the ideal electronic Filofax — with a database, an address-book application or DA, or with HyperCard's Address and DateBook stacks. But after you've entered all those names, addresses, phone numbers, and appointments, the most portable way to take all that data on the road is with WristMac. In addition to being a full-featured digital watch, WristMac can transfer up to eighty 24-character messages from — and to — QuickDex, Focal Point, 4th Dimension, HyperCard, and other applications. WristMac's HyperCard software lets you build multiple master lists and can even be used as a stand-alone scheduler and address book. From the plastic-bodied WristMac Standard to the stainless-steel Executive Gold, all systems come complete with watch, cable, and software. WristMac Standard, $149; Colored (red, green, blue, yellow, or gray), $149; Executive, $199; Gold or Silver, $249; Pocket WristMac, $199. Microseeds Publishing, 7030-B W. Hillsborough Avenue, Tampa, FL 33634; (813) 882-8635.

Accessories

Comfort Zone Back Cushion
Ergonomic Footrest

One way to boost productivity is to make your working environment more comfortable — it's easier to work if you aren't dwelling on your aching back. Two products that can help are the Comfort Zone Back Cushion and the Ergonomic Footrest. The cushion supports the back and spine so that your posture is improved, reducing the risk of muscle strain. The footrest positions your legs for better circulation. Comfort Zone Back Cushion, $29.95; Ergonomic Footrest, $34.95. ACCO International, 770 S. Acco Plaza, Wheeling, IL 60090; (708) 541-9500.



Computer Critters

Looking for something for the Mac owner who has everything? Computer Critters are plush arms, legs, snouts, ears, and tails that let you turn your Mac into a rabbit, dragon,

bulldog, or bear. For better or worse, they're the cutest peripherals on the market. Dragon or bulldog, $34.95; rabbit or bear, $29.95. Computer Critters, P.O. Box 5401, Hacienda Heights, CA 91745; (818) 333-7273.



Deskettes

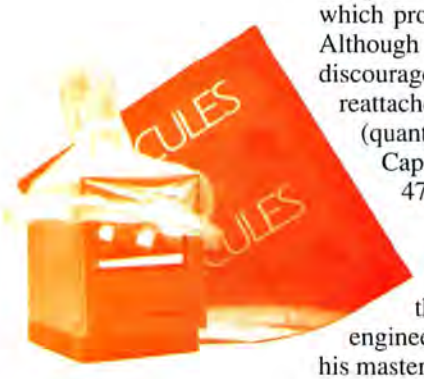
These brightly colored acrylic storage drawers are a stylish and efficient way to keep your floppies in order. They can hold a lot of bytes – the smallest model stores 72 disks and the largest model holds more than 1,100. Deskettes come in clear acrylic for shy, retiring types and fluorescent blue, green, or red for the more outrageous among you. Depending on size and color, Deskettes range in price from $14.95 to $219.95. Deskette, 1501 E. Chapman Avenue, Suite 168, Fullerton, CA 92631; (800) 323-6545 or (714) 996-6645.

Footers for the Macintosh

Quake/Grip Desktop Fastening System

Anyone who experienced last year's 7.1 earthquake in the San Francisco Bay Area knows that excessive vibration is not good for Macs, their peripherals, or their owners. Even if you don't live on a fault line, you might want to protect your equipment from unexpected shocks caused by natural disasters or just plain clumsiness. Enter Footers for the Macintosh, a set of four disks (made of a special energy-absorbing compound) that you place under your equipment. The Footers absorb and dissipate vibrations, and for ImageWriter users, they have the advantage of reducing excessive printer noise. Set of four Footers, $49.95. Monster Design, 274 Wattis Way, South San Francisco, CA 94080; (415) 871-6000.

Velcro USA claims that its Quake/Grip Desktop Fastening Systems were 100-percent effective in preventing equipment damage during the San Francisco earthquake among an installed base that includes businesses, hospitals, schools, and households. Quake/Grips are industrial-strength Velcro fasteners that have a holding strength of 5 to 30 pounds each (depending on size). A kit for a compact Mac consists of four footpad fasteners and two "leashes," which protect the keyboard while still allowing free movement. Although the fasteners are impressively strong (they can even discourage would-be thieves), equipment can still be moved and reattached as needed. Kit prices range from $15.95 to $36.95 (quantity discounts available). Velcro USA, P.O. Box 2422, Capistrano Beach, CA 92664; (800) 666-4302 or (213) 258-4747.



Hercules Computer Condom

The Hercules Computer Condom is probably the ultimate in tasteless-gag gifts — a dustcover for the Mac that looks like a prophylactic. It was developed by an engineering student at the University of Arizona to help pay for his master's degree. The Condom is made of heavy-duty antistatic vinyl and is heat-sealed by a method developed by another UA student. It comes in a condomlike package, but unlike the real item, a Computer Condom can be rerolled and stored in the resealable package until you next need it. $24.95 plus $5 shipping (state computer and monitor type). Byte-Me-Hardware, P.O. Box 3738, Tucson, AZ 85722; (602) 327-4893.

JetFill

Owners of Hewlett-Packard's popular DeskJet, DeskJet Plus, and

DeskWriter printers now have a way to recycle their toner cartridges. JetFill is a cartridge refiller that looks like a huge hypodermic needle and makes a potentially messy job a lot easier. You simply insert the needle into the top of the toner cartridge, and a premeasured supply of ink refills the cartridge. JetFill contains custom-formulated ink, and you can use it to refill a toner cartridge up to ten times. $12.95. JetFill, 2021 Guadalupe, Suite 8A, Austin, TX 78705; (800) 749-2993 or (512) 469-5647.



Mickey Mouse Mouse Pad
MonsterMat

If you like to whistle while you work, then you'll probably like Mickey Mouse Mouse Pads. These round, brightly colored pads may not improve your productivity, but they will add to your office ambience. Computer Giftware has a licensing agreement with Walt Disney, so expect more Disney-character mouse pads and disk holders in the future, including a Dick Tracy mouse pad. $15.95. The Computer Giftware Company, 521 State Street, Glendale, CA 91203; (818) 500-7857.

The MonsterMat is a monstrous (30 x 22 inches) mouse pad that doubles as a desk blotter. Why would you want such a gigantic mouse pad? Well, it's hard to steal; it lets you use your mouse over the entire surface of your desk; and if you spill coffee on it, you won't damage or stain it. Also, it looks cool. $39.95. Limit Zero, 247225 Ontario, El Toro, CA 92630; (714) 361-2661.

Neon Ultimate SE Bag
Madson Portable Case



Sometimes you and your Mac have to go places, and on those occasions, it's nice to have something spiffy to carry the Mac around in. The Neon Ultimate SE Bag features straps and accents in not-to-be-overlooked colors — fluorescent green, hot pink, or brilliant yellow. The case has outside pockets for manuals, mouse pads, and disks, plus padded inside pockets for the keyboard and the mouse. It has a water-resistant shell and high-density foam padding. $139.95. I/O Design, 924 Springdale Drive, Exton, PA 19341; (800) 241-2122.

With the Madson Portable Case, you can create a movable office wherever you are. You can keep airline tickets, keys, pens, paper, battery packs, and disks in the outside pockets, and by partially unzipping the case, you can set up the Portable without taking it out of the case. The Madson Portable case has been updated since we reviewed it in the September '90 issue (see Pinstripe Picks, page 42): You now have access to the back of the Portable, so you can plug it in without taking it out of the case; there's a side opening that lets you insert disks; and the pouch for the AC adapter and recharger is attached to the strap with Velcro tabs. $145. The Madson Line, P.O. Box 338, Corte Madera, CA 94925; (415) 927-3600.



Entertainment

The Cycles: International Grand Prix Racing
The Duel: Test Drive II

These black-and-white games are just the ticket when you feel the need for speed. In The Cycles: International Grand Prix Racing, you

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race high-powered motorcycles at 15 race courses that copy those on the actual professional circuit. The Duel: Test Drive II puts you into an expensive European sports car for a driving duel with a computer-controlled car. You race over mountains, through forests, and along coastal roads and highways. Two optional car disks available for The Duel add other European supercars or American muscle cars. There are also optional scenery disks: the California coastline and great highways of Europe. Where else can you drive a hot car as fast as you want and get rewarded for outrunning the highway patrol? The Cycles: International Grand Prix Racing, $49.95. The Duel: Test Drive II, $54.95. Car and scenery disks, $21.95 each. Accolade, 550 S. Winchester Blvd., San Jose, CA 95128; (408) 985-1700.



Darwin's Dilemma

Darwin's Dilemma is a challenging game loosely based on the ideas of evolution. Your mission is to get lower life forms to combine and evolve into complex ones. At each level of evolution, you come across new creatures and dilemmas, and you may have a tough time evolving into homo sapiens. This game requires planning and clear thinking, and it can quickly become addictive. The creatures are nicely rendered in color. $49.95. Inline Design, 5 W. Mountain Road, Sharon, CT 06069; (203) 364-0063.



Ishido: The Way of Stones

Ishido: The Way of Stones is one of those rare finds that make you glad you own a Mac. Already nominated for Best Strategy Program of the Year by the Software Publishing Association, Ishido is the master of stone or tile board games such as Shanghai and mah-jongg. The purpose is to make matches of the various stones you draw from a pouch. An easy-to-learn but deceptively challenging game, Ishido is adorned with magnificent graphics and wonderful sound, and the color version is stunning. You can edit and create your own stone sets and playing boards and play solitaire or against another player. Ishido's oracle answers your existential questions when you've completed a coveted four-way match. The oracle's answers are based on the *I Ching: The Sacred Books of China.*



Until recently, Ishido was available only in an expensive, limited collector's edition. Now it's finally repackaged and affordable for the general public, and you're in for a real treat. $54.95. Accolade, 550 S. Winchester Blvd., San Jose, CA 95128; (408) 985-1700. A limited number of walnut-boxed collector's editions ($175) are available from Publishing International, 333 W. El Camino Real, Suite 222, Sunnyvale, CA 94087; (408) 738-4311.

P-51 Mustang

This jewel of a simulator puts you into the cockpit of a P-51 Mustang fighter. You dogfight against the deadly German Me109 and strafe ground targets such as planes, trains, trucks, and buildings. P-51 Mustang has a 3-D simulator with various outside views as well as full views from the cockpit. You have to learn to navigate by sight and compass while you are flying to and from your targets. The built-in video recorder lets you play back

exciting sequences of your mission from any viewing angle. When you're ready for the ultimate challenge, go head-to-head against another player. Expect a color polygon version of P-51 by the time you read this. $59. Bull's Eye Software, P.O. Drawer 7900, Incline Village, NV 89450; (702) 265-2298.



PuzzleMaker
Puzzle Suite

PuzzleMaker is for people who like jigsaw puzzles. It lets you create puzzles out of any graphic image and then move, stack, flip, or rotate the pieces. The real challenge is putting the pieces back together to form the original image. $49.95. ImaTeQ Systems, 3553 31st Street N.W., Suite 125, Calgary, Alberta T2L 2K7, Canada.

Puzzle Suite is a collection of six classic logic puzzles — Escape!, Pentominoes, Solitaire, Switch, Target, and Triangle. Sample solutions are provided for all puzzles, and you can save and replay solutions one step at a time. (At press time, there was a bug that you could circumvent by moving all the files out of the Solutions folder.) $34.95. Dodeca Graphics Ltd., 7024 W. Wisconsin Avenue, Wauwatosa, WI 53213; (800) 347-1146.

SimCity

If you're tired of the local politicians ruining your neighborhood, SimCity gives you the chance to show them how to do it right.



SimCity — a simulation of a city environment, complete with crime, pollution, and natural disasters — is a Macintosh classic. You control the budgets; create industry; build shopping centers, parks, and stadiums; and develop transportation while the city grows and changes before your eyes. You have to meet the ongoing demands of your constituents (called Sims) and juggle a dozen things to keep your city running smoothly. SimCity comes in both black-and-white and color versions. There's also a Terrain Editor that lets you customize the geography and cities. If you prefer a global challenge, the soon-to-be-released SimEarth lets you mold a planet from a gas cloud through the evolution of life to the nuclear age. SimCity, $49.95 (black-and-white) or $79.95 (color). Terrain Editor, $24.95. Maxis, 1042 Country Club Drive, Suite C, Moraga, CA 94556; (800) 521-6263 or (415) 376-6434.

Sky Shadow

Written by the author of the phenomenally popular Crystal Quest, Sky Shadow looks like another winner for Casady & Greene. In Sky Shadow, your mission is to protect your hometown from the evil Razoropers (you're provided with missiles, bombs, and a protective force field). You pilot a ship that looks like a battered saucepan (or is it a mutant flying pig?) across a colorful landscape. To refresh your supplies, you must land the ship at an airstrip, which isn't as easy as it sounds (and nearly impossible to master in Mega-Mode). Part of the appeal of this fast-moving, exuberant, offbeat game is the sound effects, such as cheers after you've made a successful hit, gasps for breath when things start getting a little hectic, and the cries of the injured. As we said in our October '90 review (page 82), Sky Shadow isn't the best game to play in the office. $49.95. Casady & Greene, P.O. Box 223779, Carmel, CA 93922; (408) 624-8716.

Solarian II

Solarian II is a fast-paced action game with 256 colors and great sound. It's one of the few games on the Mac with a true arcade-quality feel. In fact, Solarian is so good that it's likely to keep you up nights. The graphics are extremely smooth while still showing off the Mac II's color capabilities. Solarian's programming quality rivals Crystal Quest's, but its performance feels more like that of the arcade game Galaxian. Its addictive theme develops as your expertise grows. $25. Shareware (you can get a copy from most on-line services, including Zmac).



Welltris

Welltris is a more advanced and interesting variation of the hit game Tetris, designed in the Soviet Union and brought to the U.S. by Spectrum Holobyte. In both games, you drop various geometric objects down a wall, moving and turning them to form a row. When you've formed a complete row, it disappears and you gain bonus points. If you don't complete rows fast enough, pieces stack up haphazardly and the game ends. Welltris re-creates this in three dimensions. You look down a square "well," with objects dropping from any of the four sides. Beware: This may sound simple or silly, but Welltris (like Tetris) has been known to infect even the most resistant minds, turning users into zombielike players. The game comes with beautifully rendered Russian scenes (in color) and lively Russian folk tunes. $39.95. Spectrum Holobyte, 2061 Challenger Drive, Alameda, CA 94501; (415) 522-1164.

Children's Programs



Cosmic Osmo

Cosmic Osmo is an impressive feat of HyperCard engineering that takes you or your child on a magic journey through a strange universe. You explore the world by clicking on objects on the screen. Everything, from singing potato heads to cotton-swab missiles, has a hidden function. Cosmic Osmo is filled with great drawings, digitized sounds, and animations and an unbelievable assortment of characters. From the creators of Manhole, Cosmic Osmo gives your kids the rare combination of learning and exploration along with great entertainment. The CD-ROM version includes more worlds and more music (playable on an audio-CD player when you want to get your Mac back from the kids or vice versa). Disk version, $69.95; CD-ROM, $79.95. Activision, 3885 Bohannon Drive, Menlo Park, CA 94025; (415) 329-0800.

Discis Books

This CD-ROM series of beautifully produced classic children's books uses music, sound effects, and the books' original illustrations to entertain children and encourage them to read for themselves. The titles range from Beatrix Potter's *The Tale of Peter Rabbit* to *Scary Poems for Rotten Kids*. The books on CD-ROM discs available at press time were aimed at children aged 6 to 11, although many younger children (and probably a few parents) will also enjoy them.

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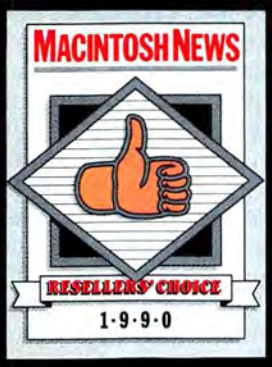
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The books appear on-screen as actual pages with text and illustrations. If you click at the beginning of a sentence, it is highlighted and read aloud. By clicking on a word, the child can hear pronunciation, an in-context definition, or a second-language translation (some of the books are available with Spanish, French, or Cantonese dictionaries). Clicking on objects in a picture identifies them. Parents or teachers can customize all these options. If you have kids and a Mac, these wonderful books are one of the best reasons for buying a CD-ROM drive. Discis books cost from $69.95 to $89.95. Discis Knowledge Research, 45 Sheppard Avenue E., Suite 802, Toronto, Ontario M2N 5W9, Canada; (416) 250-6537.

It's a Plot

If you have a budding mathematical genius in your midst, this "take home" exhibit from the Exploratorium, San Francisco's hands-on science antimuseum, might be just the ticket. Designed for kids from sixth grade up, It's a Plot enables children to plot constant, linear, quadratic, cubic, sine, sum of sines, exponential, and exponential-sine equations. It has an informative help screen, the ability to test yourself on how a plot will look, and an easy-to-use interface that requires a minimum of Macintosh knowledge. $20. The Exploratorium, 3601 Lyon Street, San Francisco, CA 94123; (415) 563-7337.

KidPix Professional

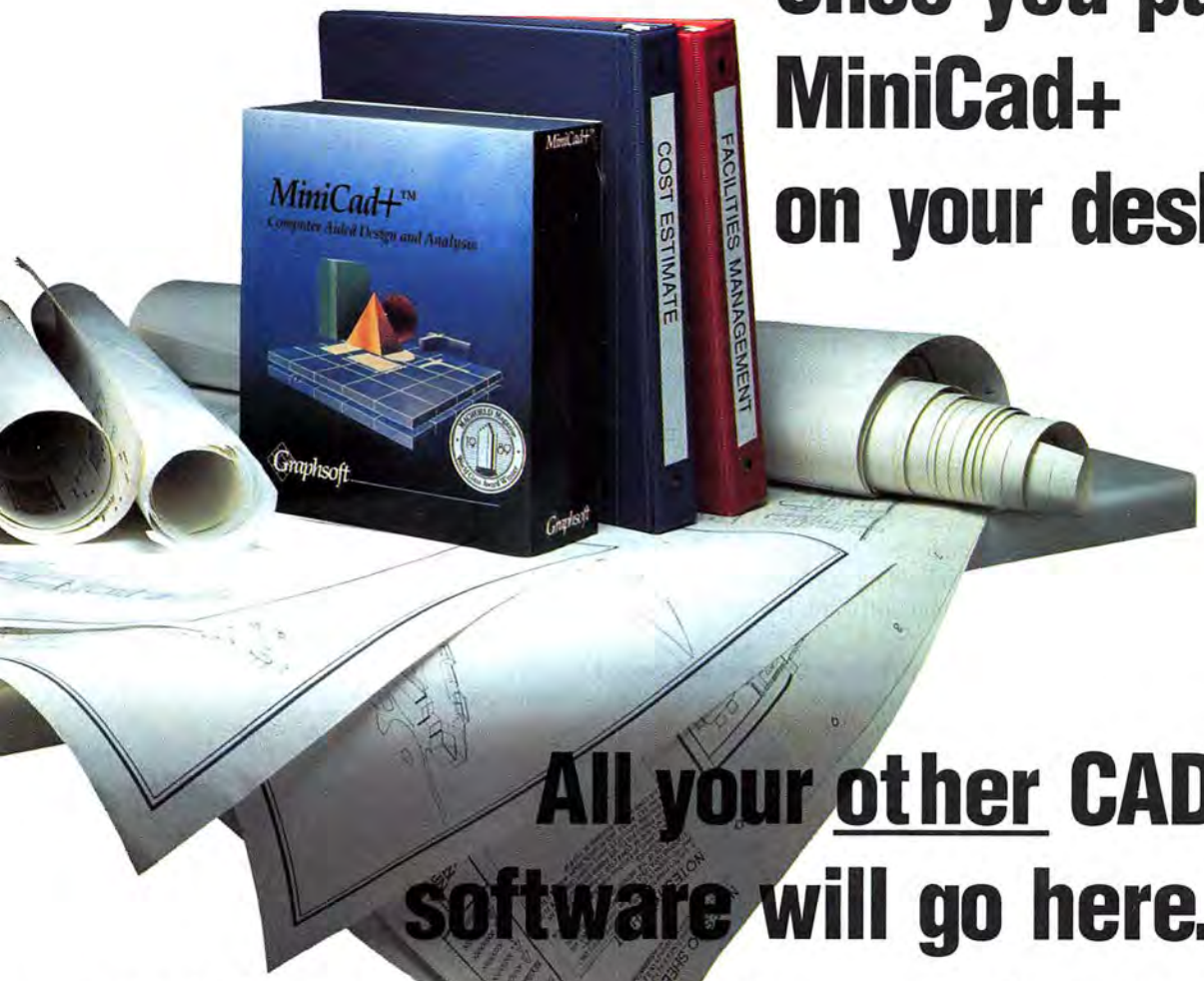


Although the Mac interface is easy to use, it wasn't developed for the average four- or five-year-old. KidPix Professional is a kid-sized paint program that introduces children to the Mac while letting them create all sorts of interesting pictures in black-and-white or color. The tools are basic versions of those available in sophisticated paint programs, such as a rubber stamp, pencil, brush, spray can, and other tools that can create swirls, star bursts, or blobs of paint. Kids can add text without using the keyboard: Letters are displayed at the bottom of the screen and can be pasted onto the picture. Originally a public-domain program, KidPix has been enhanced and is now commercially available. New features include a help screen and sounds (for example, letters of the alphabet are spoken when selected). $35. Digital Artworks, 1925 Baily Hill Road, Suite F, Eugene, OR 97405; (503) 344-6541.

List Learner

Learning lists of words, formulas, dates, scientific terms, definitions, or quotations is a chore, and students welcome anything that makes it a little easier. List Learner is an interactive learning tool that was written by Phil Wyman, a member of Apple's HyperCard development team. List Learner divides information into "items" and their "associations," much like a dictionary, and students can test their knowledge, using flash cards or matching-quiz modes. List Learner grows with the student: A basic knowledge of the Mac and HyperCard are all you need to start, but users with advanced knowledge of HyperCard and HyperTalk can modify List Learner to suit their needs. $59.95. Selective Memory, P.O. Box 710098, San Jose, CA 95171; (800) 695-0915 or (408) 371-5595.

Once you put MiniCad+ on your desktop...



All your other CAD software will go here.



There are a lot of contenders—and pretenders—coming into the Macintosh market with so-called "full-featured" CAD programs. But there's one program these imitators won't compare to: MiniCad+. It set the standard for all Mac CAD programs when it was introduced in 1986, and continues to set the pace in Macintosh-aided design.

Discover Our Dimensions

MiniCad+ is an award-winning 2D/3D package. Whether you're designing a house or high-tech mousetrap, you'll find the precision you need.

Smarter than the Average Mouse

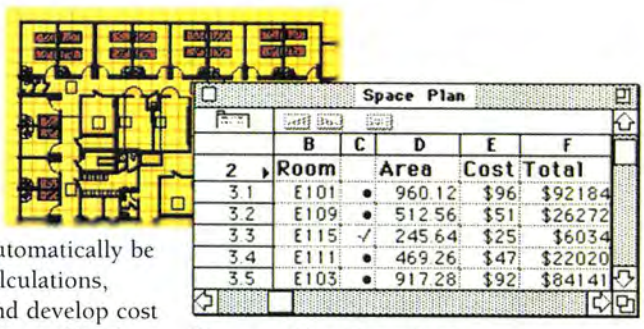
Our "Smart Cursor" automatically highlights, identifies and aligns relevant snaps, intersections, tangents and parallels. Snap to the precise point every time with more ease than you've experienced with any other program. We built the brains into MiniCad+ so you can think of more important things.



Click with Intelligence

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Unlike any other drawing program, MiniCad+ provides an integrated worksheet—literally, a spreadsheet and database in one—hot-linked to your drawings. Attach records such as type, cost, P.O. number or size and display at will. As you change an object's attributes, the worksheet will automatically be updated. Compute area calculations, compile parts schedules and develop cost estimates. No longer will you tediously count objects in your drawing manually—the worksheet will count it for you.



Programmability

Don't be confined by your CAD program. Extend the capability of MiniCad+ by developing your own palettes with our macro language. You can create your own Facilities Management palette, for instance. We've included a wide variety of special-topic palettes with MiniCad+; others are available from third-party vendors.

Draw on Our Experience

Packed with features, the only thing small about MiniCad+ is the price. There's not another high-precision, professional package with such a low price tag.

MiniCad+ is the price/performance leader in Macintosh CAD, so don't throw your money in the Trash. You owe it to your crowded desktop to ask your favorite distributor for MiniCad+, or call us for more information.

Graphsoft

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The Playroom

The Playroom is an educational program that doubles as entertainment. Our three-year-old tester, Sean, needed only half an hour to learn all the Mac moves required to navigate through the program. He thinks he's just playing games, but he's also learning to tell time, count, read, spell, tell stories, and use analytical skills. Occasionally the program's response time is frustratingly slow, which may tempt preschoolers to repeatedly punch the mouse button in a fruitless attempt to speed things up. In general, though, The Playroom's six games — The Cuckoo Clock, The Mixed-Up Toy, The Mousehole, The Spinners Toy, The ABC Book, and The Computer — will delight most young children and hold their attention. $49.95. Brøderbund Software, 14 Paul Drive, San Rafael 94903; (800) 521-6263.



Where in Time Is Carmen Sandiego?

The latest entry in the immensely popular Carmen Sandiego series has you chasing Carmen through time. These "games" are actually educational programs that teach geography and historical facts through a detective motif. This time around, Carmen and her gang of thieves (who will soon be the stars of an animated TV show!) are out to heist the world's priceless treasures from various time periods. You use the Chronoskimmer to follow your suspects to different countries in different times. By searching the area and interrogating witnesses, you gather the historical clues needed to capture the bad guys. Fortunately, the game comes with a copy of *The New American Desk Encyclopedia* to help you understand and interpret the clues. Other games in this series are Where in the World Is Carmen Sandiego?, Where in the USA Is Carmen Sandiego?, and Where in Europe Is Carmen Sandiego? $49.95 each. Brøderbund Software, 17 Paul Drive, San Rafael, CA 94903; (800) 521-6263.



Resources

The Art of Human-Computer Interface Design

This comprehensive volume examines one of the most important aspects of computers — the user interface. It was conceived by S. Joy Mountford, manager of the Human Interface Group at Apple, and Brenda Laurel, who edited the 50 articles on the relationship between humans and computers. Topics range from practical studies to philosophical discussions to prophesies of a world in which cyberspace and multimedia systems are commonplace. This 500-page tome looks daunting, but once you've sampled the thought-provoking and fascinating material it contains, you'll find it very hard to put down. $26.95. Addison-Wesley Publishing Co., Route 128, Reading, MA 01867; (617) 944-3700.



Encyclopedia Macintosh

Encyclopedia Macintosh is just that — a compendium of everything you might possibly want to know about the Mac and its methods. Written by Craig Danuloff and Deke McClelland, the book is divided into four sections: System

Manufacturer's Reps Inquiries Welcome

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Forget everything you've heard about Macintosh® video. With Intelligent Resources' Video Explorer, video will never be the same! We've invented a totally new kind of video card for the Macintosh, with incredible real-time video processing capabilities. The Video Explorer is a multi-synchronous card that supports all major broadcast video and computer graphic timing standards. On it you'll find a state-of-the-art custom chip set, one of the largest and most powerful ever produced for personal computers.



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Software and Utilities, Applications, Hardware, and Resources. The Applications section features easily photocopied reference pages with hot-key shortcuts for some of the major Mac programs. $26.95. Sybex, 2021 Challenger Drive, Suite 100, Alameda, CA 94501; (415) 523-8233.

GEM CD-ROM
USA Factbook CD-ROM

For anyone with a CD-ROM drive, the GEM CD-ROM disc contains almost an overabundance of material — 620 megabytes of the newest public-domain and shareware software. (GEM, according to Wayzata Technology, stands for Generous Efforts of Many.) It includes art and graphics, business tools, sound files, INITs and cdevs, utilities, and several hard-to-categorize files such as instructional training. Note: The GEM disc was designed with multiple partitions to speed access time and allow the handling of large numbers of files and icons, so you need to use a driver (such as the Trantor Systems Driver and Optical Media International Driver) that supports multiple partitions.



The USA Factbook CD-ROM disc is an almanac of the United States and its territories. This disc is updated annually and includes maps; vital statistics; and information on state geography, government, politics, economies, and traditions. GEM CD-ROM, $119; USA Factbook CD-ROM, $139. Wayzata Technology, 16221 Main Avenue S.E., P.O. Box 87, Prior Lake, MN 55372; (800) 735-7321 or (612) 447-7321.

Guide to the Macintosh Family Hardware

This book is a must-buy gift if you know a systems programmer or engineer or if you'd like to investigate the Mac's inner workings yourself. The second edition of this manual, written by staff at Apple, is the official and definitive guide to the hardware design of all Macs from the Plus to the IIfx (as well as earlier models). Chapters look at major features such as memory and power supplies and describe the way each feature is implemented on each Mac model. There's a glossary of technical terms and a list of specifications for each type of Mac. This book will prove invaluable to anyone who needs to understand how Mac hardware works, to create compatible software and hardware. $26.95. Addison-Wesley Publishing Co., Route 128, Reading, MA 01867; (617) 944-3700.

The Little Mac Book
The Mac Is Not a Typewriter

These small, attractive paperbacks, both written by Robin Williams (no, she's not *that* Robin Williams), are basic introductions to working with the Macintosh and making the most of its graphic and typesetting capabilities. *The Little Mac Book* is a simple but thorough introduction to using and understanding the Macintosh. It's written at a fairly basic level, but in conjunction with *The Macintosh Bible*, it's an ideal gift for a new Macintosh owner, especially the student on your list.



The Mac Is Not a Typewriter should be required reading for every writer and designer who uses the Mac. It covers everything you need to know to turn out professional-looking



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documents, from using "smart" quotation marks and apostrophes, to kerning and leading, to choosing a typeface. In 70-odd pages, you get a crash course in typesetting and learn how to put your new-found knowledge into practice (and get your money's worth out of your Mac while you're at it). A great little book for novice and expert alike. *The Little Mac Book,* $12.95; *The Mac Is Not a Typewriter,* $9.95. Peachpit Press, 1085 Keith Avenue, Berkeley CA 94708; (415) 524-9775.

The Macintosh Bible What Do I Do Now?

Calling any book the bible of its kind risks celestial disfavor, but *The Macintosh Bible* is one book for which the hype is wholly kosher. You'll find this fat volume (and a very few others) on the bookshelves of Macintosh troubleshooters, evangelists, experienced system managers, teachers, and power users. The third edition of *The Macintosh Bible* (edited by Arthur Naiman) expands on the already thorough coverage of basic Macintosh hardware, system software, popular applications, and so on.



Charles Rubin has written a companion book, *What Do I Do Now?,* that covers hundreds of potential crises and tells you exactly what to do (instead of panicking). *The Macintosh Bible,* $28; *What Do I Do Now?,* $12. Goldstein & Blair, Box 7635, Berkeley, CA 94707; (415) 524-4000.

Macintosh Repair and Upgrade Secrets

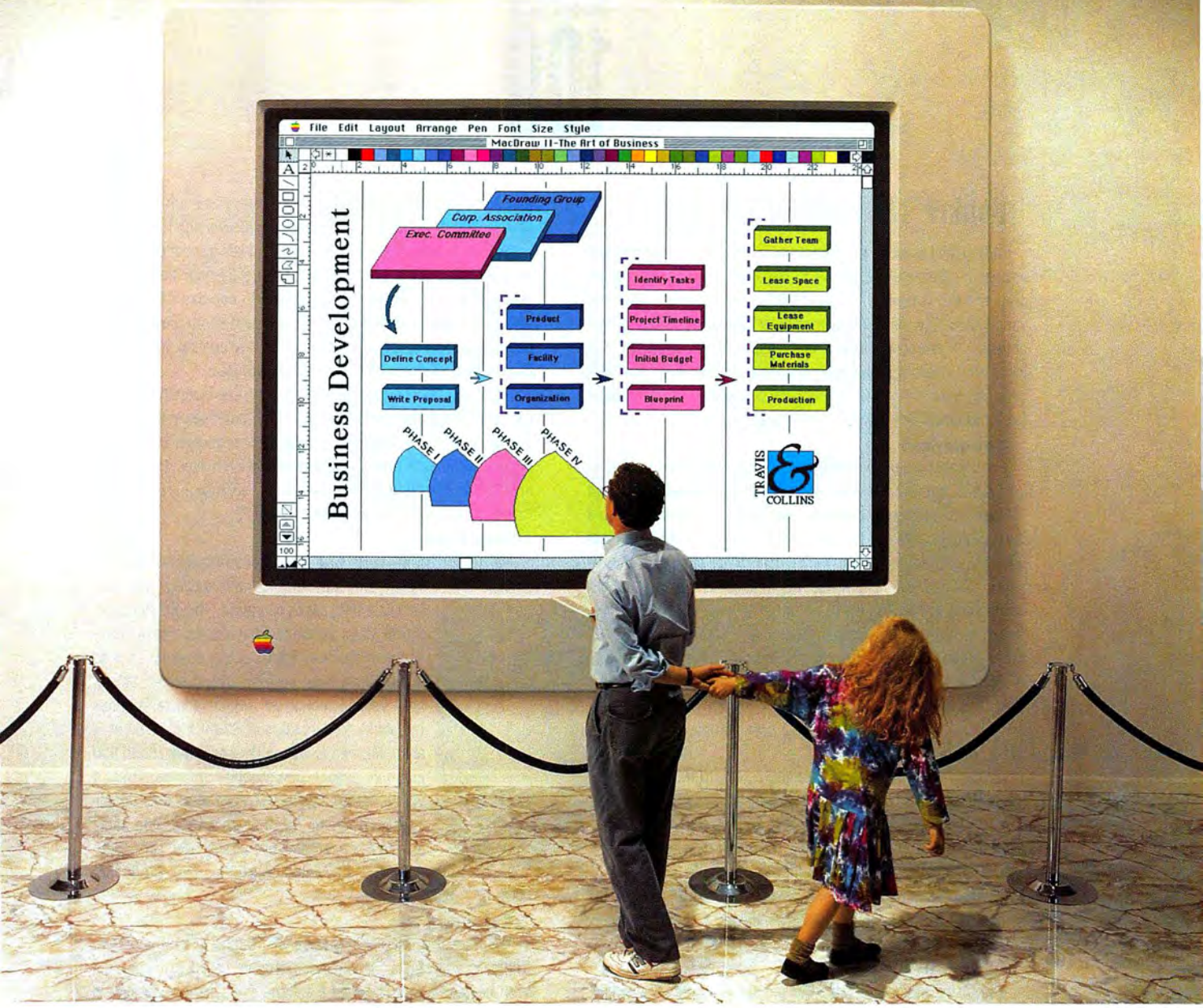


In this immensely helpful guide for the technically adept, author Larry Pina clearly lays out the steps required to repair or upgrade Macs ranging from the Lisa and Macintosh XL to the 128K and SE. Pina starts with safety rules and preliminary checks and then launches into troubleshooting to help you diagnose and solve your problems. The book explains upgrade options for audio, video, disk drive, RAM, ROM, and SCSI. Even if you'd rather leave major repairs or upgrades to the professionals, this guide is worth having on your bookshelf just for the education you'll get and the ability to speak knowledgeably with dealers and technicians. $32.95. MacMillan Publishing, Front and Brown, Riverside, NJ 08075; (800) 257-5755.

Stupid Mac Tricks

Bob LeVitus is probably best known for his book *Dr. Macintosh* ($19.95, Addison-Wesley), and he's also responsible for *MacUser*'s Help Folder (see his gift picks elsewhere in this article). His new book (with companion disk) is called *Stupid Mac Tricks,* an appropriate title for this compendium of all the silliest Macintosh shareware programs, including MacBarf, the original Fish! screen saver, Sexplosion, a demo version of the Talking Moose, and SoundMaster.

The book briefly but lovingly describes the history of each of the 14 gems included and tells you how to install the programs for maximum enjoyment and minimum disruption to your system. $19.95. (Note: Some of the included software requires you to pay shareware fees if you continue using the software after test-driving it.) Addison-Wesley Publishing Co., Route 128, Reading, MA 01867; (617) 944-3700.



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Bobker's Dozen Best

During the past year, I reviewed and rated hundreds of products in Bobker's Dozen. Here are the 13 that I feel are the cream of the crop and the reasons why. I've tried to pick products in a wide variety of categories, such as hardware, information sharing, and utilities. In categories where there are a lot of products, I've included runners-up. And because some of these products have been upgraded since the original reviews appeared, I've updated the information and noted any new features.

Boomerang

The time you spend working at your computer can be separated into productive time and nonproductive time. Maintenance and navigation don't directly produce useful results, but you can't avoid them either. Boomerang is a file-and folder-management utility that reduces nonproductive time dramatically. It has simply taken over my Open and Save dialog boxes. I don't need to use anything but Boomerang to find any file or put a file anywhere. Since I wrote my original review, Boomerang, which was shareware, has been acquired by Now Software and rechristened Super Boomerang, and it will be added to Now Utilities (see the "Utilities" section of this article). Super Boomerang has a new interface and a couple of new features.



As much as I like Boomerang, Aladdin's ShortCut has much the same functionality, plus the ability to look into compressed StuffIt files. But Boomerang has the edge because of its smooth interface and the way it handles recently opened files and folders. Registered Boomerang owners can get a free upgrade to the commercial version by contacting Now Software, 520 S.W. Harrison, Suite 435, Portland, OR 97201; (800) 327-3611.

Complete Undelete

Complete Undelete is a nearly perfect example of a single-function utility. It's elegant and transparent, and it works when you need it, without fail. I move lots of files around, and occasionally I toss a file I want. Every time I make that kind of dumb move, Complete Undelete saves me. It's been criticized for not doing something it was never designed to do: Recover files lost before it was installed. In my view, that's simply sour grapes. The slick power of Complete Undelete makes it my Mac product of the year. $79.95. Microcom Software, P.O. Box 51816, Durham, NC 27717; (919) 490-1277.



Disinfectant

Disinfectant is a free antiviral program remarkable for its power, elegance, and speed. New versions capable of detecting the latest viruses appear on national on-line services within a day or two of a virus's discovery. John Norstad, the author, works with other antiviral-tool authors (including those with commercial products) to analyze new viruses and find ways to neutralize them. The latest version, 2.0, includes a superb automatic-prevention INIT.

As for runners-up, Symantec's SAM 2.0 has a super prevention module called SAM Intercept. Symantec's 24-hour hot line has information that lets users update SAM to combat new viruses. Rival, from Microseeds, works a bit differently from the way most prevention tools do, checking files as they are opened. It's fast and hard to beat — yet another five-mouse program.

However, Disinfectant stands apart for its incredible built-in information and documentation file, which just keeps getting better and better. Available free from on-line services such as Zmac. John Norstad, Academic Computing and Network Services, Northwestern University, 2129 Sheridan Road, Evanston, IL 60208; CompuServe: 76666,573; AppleLink: A0173.

Disk Doubler

File compression makes saving and transmitting files far more efficient. The resultant time and storage-media savings generally translate to cheaper operation. The old standard, StuffIt, does a good job, but it doesn't save nearly as much space as Disk Doubler does nor is it as quick. Since I last covered Disk Doubler, Salient has released version 2.0, which is faster and has the ability to decompress StuffIt files. Salient is also distributing free INITs and applications that can only unpack Disk Doubler archives. Thus, if you have Disk Doubler, you can send other people your archive and the small decompression utility so they can access everything you sent. $79. Salient, 3101 Avalon Court, Palo Alto, CA 94306; (415) 852-9567.

Exposure Pro

This screen-capture utility has gone through a lot in its short life. Originally a lackluster, inconsistent product called Exposure, it's been beefed up and renamed Exposure Pro. The new version is finally reliable, and it can even capture "uncatchable" screens such as active modules in Pyro! and After Dark. Exposure has more graphics capabilities than some basic graphics programs, and it's a slick performer once you've mastered its odd and (to my eye) ugly interface. It's still huge (more than 300K), but if you have the room and memory to use it, no other program can do the job quite as well. It's a real productivity champ.

As for runners-up, Capture 3.0 is still the choice when space counts (physically, it's the smallest). Other near-winners in this crowded field are SnapJot and Image Grabber. Exposure Pro, $139.95 (requires System 4.1 or later). Preferred Publishers, 1770 Moriah Woods Blvd., Memphis, TN 38117; (901) 683-3383.



Number Munchers

Number Munchers (its verbal cousin is called Word Munchers) teaches a variety of basic math skills to students in grades 3 through 8. The difficulty levels are

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infinitely variable and easy for parents or teachers to set and adjust. The easy levels are easy, and the hardest levels will challenge anyone. Number Munchers has superb network-control features, allowing whole classes to use it effectively. The administrative design is as superb as the play mechanics. $49.95. MECC, 3490 Lexington Avenue N., St. Paul, MN 55126; (800) 228-3504, (800) 782-0032 (in MN), or (612) 481-3500.

PowerKey

One frustration of owning an SE or SE/30 is that you can't start the machine with the Power On key. PowerKey is a terrific add-on device that neatly solves this problem. It sits between your keyboard cable and the ADB port, letting you turn on the Mac and up to three peripherals with the Power On key. Like a TV remote control, this seems like a crazy indulgence until you try it — then you'll wonder how you ever lived without it.



PowerKey's software lets you program a timed event such as turning the Mac on or executing a keyboard macro. When used in combination with a macro utility, this single action can trigger events such as unattended tape backups or modem transmissions. In fact, PowerKey is bundled with QuicKeys Lite, a "junior" version of CE Software's QuicKeys macro program (see QuicKeys in the "Bob's Best Buys" sidebar). The optional Wake-up Cable lets you turn on your Mac remotely, using a modem. As if all that weren't enough, PowerKey includes four surge-protected sockets and the packaging is made of recycled materials. PowerKey, $99; Wake-up Cable, $49. Sophisticated Circuits, 19017 120th Avenue N.E., Suite 106, Bothell, WA 98011; (206) 485-7979.

Shanghai

No other game has endured as long as Shanghai, a testament to its quality and addictiveness. Shanghai can be played on many levels, and most games take roughly the same amount of time to play, no matter what their level. This is great, because other multilevel action games can take forever once you've become good. Anyone can win at Shanghai, although good players will win far more frequently (a nice change from adventure games that can be won only by the young and the quick). Shanghai is also a very attractive game, especially in its color versions.



Shanghai's runner-up is PipeDream (Lucasfilm), an arcade game that rewards foresight and planning. Its main drawback is that games take too long (half an hour or more) once you've gotten really good. Shanghai, $29.95. Mediagenic, 3885 Bohannon Drive, Menlo Park, CA 94025; (415) 329-0500.

Silverlining

Silverlining has bailed me out of so many tough situations that I've lost count. It works well on every brand of hard disk I've used, and it's easy to use. As a bonus, the newest versions include a disk-optimization feature. There's a lot of power in Silverlining, and that makes reading the manual mandatory, as careless use can damage your files. For real power use, there's a "secret" diagnostics menu that you can display by typing Command-D. Be very careful when using these tools! $99.95. La Cie, 19552 S.W. 90th Street, Tualatin, OR 97062; (800) 999-0143 or (503) 691-0771.

SuperGlue II

SuperGlue II is a standard. People use it so they can share documents without everyone's having the actual application. SuperGlue is a print-to-disk utility that turns any file — text, spreadsheet, database, page layout — into a PICT graphic that can be viewed page by page, edited, and printed with the SuperViewer DA. Or you can simply pop the captured images into another publication. SuperGlue lets you insert information into programs that don't accept many file formats and preview images, even though your application doesn't have a preview option. If you send the freely distributable Glue Viewer DA with your images, other users can open and print them. The package also includes GlueNotes, which lets you add the electronic equivalent of Post-it notes to the images. $119.95. Solutions International, 30 Commerce Street, Williston, VT 05495; (802) 658-5506.

SuperLaserSpool

There's no reason to wait for even the fastest printer — a good spooler will always be faster. SuperLaserSpool is the best, most reliable spooler on the market. Don't be put off by the "Laser" in the name: You can use this spooler with any printer. Even ImageWriter users will want it in preference to SuperSpool. SuperLaserSpool is the first spooler to work with the DeskWriter. Indeed, it's so useful that you should consider it a basic part of any DeskWriter package. Fifth Generation acquired SuperLaserSpool (and its sibling, SuperSpool) from SuperMac last summer. $149.95. Fifth Generation Systems, 10049 Reiger Road, Baton Rouge, LA 70809; (504) 291-7221.



The Vietnam War

I didn't think it was possible to create a book in HyperCard that was good enough to read and reread, but Paul Gabel's The Vietnam War proved me wrong. I've gone through this multimegabyte project several times, each time discovering new things and being totally enchanted with the whole production. This should be a model for every HyperCard-based history and education project. There will be an upgraded version for HyperCard 2.0. $24.95. Regeneration Software, 377 Collado Drive, Scotts Valley, CA 95066; (408) 438-5791.

Virtual

You can never have too much memory, even if it isn't physical RAM. Virtual gives you up to 14 megabytes of effective RAM — finally, you have the working room to use MultiFinder effectively. It's very reliable, but for those who have problems, Connectix runs one of the best technical-support operations I've come across. Virtual should be a strong contender even after System 7.0 is released. Requires a 68030 CPU or separate PMMU. $199; $275 with PMMU chip. Connectix, 125 Constitution Drive, Menlo Park, CA 94025; (415) 324-0727.


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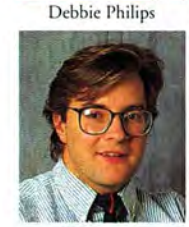

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Deck	$299
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Alchemy	$429
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MusicWriter	$89
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Sybil	$219
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News, Views, & Product Tips

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The DoveFax is a complete communications solution! It combines a 9600 baud fax modem and a 2400 baud Hayes compatible data modem into one compact unit. It performs true background operation allowing you to convert, send, and receive faxes while you continue working. The pre-scheduled transmission feature allows you to send faxes after hours when rates are lower. **$279**

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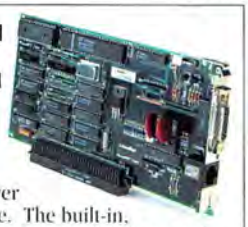


This full featured 2400 baud external modem is AT-command compatible and comes complete with MAcKNOWLEDGE communications software and cable. The nonvolatile RAM allows you to stores numbers and your favorite configurations for immediate access. **$189**

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Farallon PhoneNET Connector 10-Pack $198
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Dayna Communications DaynaTalk PC $209
Dayna Communications EtherPrint $349
Asante MacCon+ IIET $334
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The Rival 19" Monochrome Display *by Mega Graphics*

MacWorld Magazine rated the Rival the top performing WYSIWYG big screen — outranking dual-page displays costing much more. "Its darkened-glass screen effectively enhances contrast and reduces glare" *MacUser Magazine.*
Rival 19" Monochrome w/video card $1199
Rival 19" Gray Scale (Mac II) w/video card $1995
Rival 19" Gray Scale (SE/30) w/video card . $2169

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NEC MacSync 14" Color HC $499
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RasterOps ColorBoard 264 (Mac II) $589
Micron 8-bit Video Card (Mac II, SE/30) .. $349
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Europa SyQuest 45 Mb Removable $699
Additional 45 Mb SyQuest Cartridges $85
Quantum Internal w/software & bracket
40 Mb Internal 19ms w/5 yr warranty $449
80 Mb Internal 19ms w/5 yr warranty $719
105 Mb Internal 19ms w/5 yr warranty ... $779
170 Mb Internal 19ms w/5 yr warranty ... $999
IDS Wip 20 Mb External $399
IDS Wip 40 Mb External $479
DaynaFile Single 360K Drive $499
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Altra Felix $119
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Kurta Tablet (8 1/2" x 11") $279
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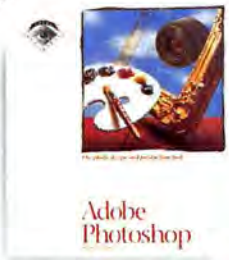
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DesignCad 2D/3D by ASBC $389
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Vellum V1.0 by Ashlar $699

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LapLink Mac III by Traveling Software $125
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Tops Network Bundle $189

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Dollars & Sense V4.1 by Monogram $85
Managing Your Money V3.0 by Meca $124
Quicken V1.5 by Intuit $39

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Design Your Own Home Series by Abracadata $69
Print Shop V1.31 by Broderbund $35
Publish It Easy V1.1 by Timeworks $113

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For the Record V2.0 by Nolo Press $32
Hyperworks Organizer by Timeworks $62
Resume Kit by Spinnaker Software $38
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More V3.0 by Symantec $249
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Stepping Out II V2.02 by Berkley Systems $58
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Tempo II V1.02 by Affinity Microsystems $99
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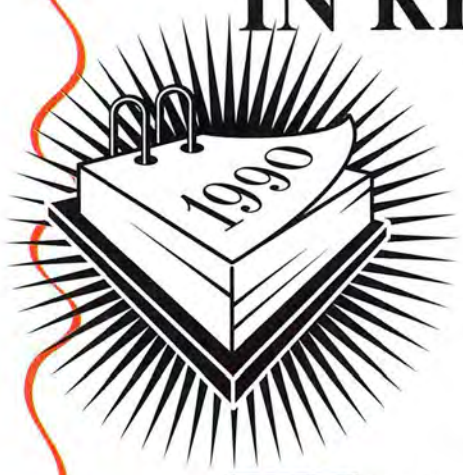
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THE YEAR IN REVIEWS



To help you put 1990 in perspective, here are the highlights of* MacUser*'s product coverage in the major software and hardware categories.

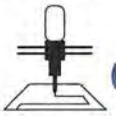
The year 1990 was a busy one at *MacUser* — we reviewed, tested, and pondered the merits of nearly 1,500 Macintosh products. In our quest to shed light on all things Mac, our coverage ranged from the sublime (the new Mac IIfx, in May) to the ridiculous (a half-million-dollar UltraMac, in September). To put 1990 in perspective and to give you a running start on 1991, we offer this quick overview of *MacUser*'s 1990 product coverage, along with a few hints about what to expect in the year ahead. For a detailed directory of product reviews in all categories, see the MiniFinders that appeared in the August issue (MiniFinders is also available on-line via Zmac).

By Bruce Mewhinney

Accelerators

In August MacUser Labs tested and dissected 30 accelerator and cache cards that can be used with most Macs. These products supersede the Mac's CPU (or add math coprocessor and PMMU chips) and offer a substantial performance boost. We found that Apple's own upgrades were competitively priced and sometimes clearly superior to other upgrade options. Apple's "wicked fast" IIfx upgrade (for Mac II and IIx owners) scored the ultimate five mice. Our May issue included favorable reviews of two cache cards for the Mac IIci and Mac II: DayStar's Fast Cache IIci and Dove Computer's MaraThon Racer.

In March we tested four SCSI accelerators to see how much they speed up data transfer between the Mac's CPU and a hard-disk drive. The winner? There wasn't one — none of these specialized NuBus boards did much more than put a dent in your wallet. However, these boards were pushing fast DMA (direct memory access) long before Apple officially sanctioned it, so we may see improvements on these products in 1991.



CAD

A wave of flashy, powerful computer-aided-design software arrived in 1990. In August we surveyed the professional CAD packages available on the Mac. Although many of these packages are adapted for use in specialized markets, the majority offer 2-D and 3-D tools for a broad range of industrial design. After examining products from 60 companies in various categories, we suggested you look at AutoCAD, Ashlar Vellum, MicroStation Mac, DynaPerspective, and Architrion II or put together a combination of packages to suit your specific needs. Some of the newer programs deliver numeric machine control, animation, or photorealistic image-rendering; many also provide output to color printers, plotters, and video recorders. Reviews of CAD products also appeared in March (Super 3D, Swivel 3D, Origins), April (Aperture), May (StrataVISION 3d and Ashlar Vellum), July (Blueprint), August (Radius QuickCAD Graphics Engine), and October (MacDraft).



CPUs

The superfast Mac IIfx workstation and three entry-level, affordable Macs made their debut this year, but so did GUI (graphical user interface) kid stuff — namely, Windows 3.0 for IBM PCs and compatible computers.

In May we turned our spotlight onto Apple's newest high-end Mac, the IIfx. With some slick microchip engineering and speedy video refresh, the IIfx is the computer for the most power-hungry power user. A $2,999 IIfx upgrade for the original Mac II offers a relatively painless way to maximize performance. In 1991 and beyond, many of the IIfx's high-performance features will be available in more-affordable Macintoshes.

In September we profiled some serious competition to Apple's elegant Mac Portable: the Outbound Laptop System, Colby SE/30, and Dynamac SE/30. Despite being the heavyweight, the Mac Portable survived our road tests and led the pack with a 4.5-mouse rating. Apple and Outbound clinched a midyear deal, however, with Apple officially sanctioning Outbound's light, modular design. With sluggish sales of the original Mac Portable configuration, Apple has dropped the price a full $1,000.

Also in September, we compared Windows 3.0 (Microsoft's mousey new graphical user interface) to the Macintosh's Finder and operating environment. Our authors, with many years' experience using both PCs and Macs, declared a tie for raw performance (at similar prices). The Mac was a solid winner in the ease-of-use and functionality categories, but Windows 3.0 had the edge in affordability. Apple's new System 7.0 and Microsoft's OS/2 (with Presentation Manager) for high-end PCs may turn 1991 into an interface battleground.

"In Search of the Ultimate Mac" (September) highlighted two monster Macs surrounded by an overwhelming wish list of pricey, high-powered peripherals. For those of us on a real-world budget, the article also included a souped-up Mac Plus. Finally, Apple's long-awaited introduction of low-budget Macs (see "Three Cheers for Three New Macs," in this issue) helped dispel suspicion that the Mac has evolved into a computer for the well-heeled.



Connectivity

Superfast networks and efficient mainframe links are no longer the impossible dream for corporate Mac users. In our May comparison of two active-star concentrators for use on LocalTalk networks, Farallon's StarController edged out Nuvotech's TurboStar. In June our Networking Buyer's Guide offered a complete education in connectivity concepts, technology, and available hardware/software. Articles included "How to Set Up the Perfect Network," "Are You Ready for Ethernet?" and "EtherTalk-to-LocalTalk Routers." In this issue, "The Invisible Bridge to Mainframe Data" looks at three products that connect your spreadsheet and database applications to your company mainframe's vast data resources. As lively as the connectivity market was in 1990, it will surely accelerate in 1991, as Macintoshes continue to invade corporate networks.

In Bridges, our monthly section dealing with networking issues, we discussed file-transfer software, fax modems, and the finer points of TCP/IP and UNIX. In 1991, Bridges will continue to help Mac users adapt to multiplatform environments.



Databases and Forms

Although still catching up to established PC systems, relational database programs for the Mac offer improved speed and sophisticated features. In January our coverage of forms-management software showed how such programs can combine database links and graphic-design tools. We reviewed SmartForm, TrueForm, and Fast Forms and peeked at several programs about to be released. The September issue contained favorable reviews of Fast Forms and the newer Informed Designer.

Our June issue featured the four strongest Mac databases: 4th Dimension, Omnis 5, Double Helix 3.0, and FoxBASE+/Mac. All received positive reviews, with 4th Dimension earning a five-mouse rating. In later issues, we reviewed File Force (September), Acius' new midlevel database software that's compatible with 4th Dimension, and C•A•T III (October), relational-database software for marketing-contact management.



Desktop Publishing

After much anticipation, quality color and prepress capabilities are finally wending their way to the Macintosh. Our May issue offered a comprehensive look at color publishing on the Mac, from input technologies through processing techniques to output options. In our monthly DTP section, we discussed the rapidly evolving fields of color calibration (March) and prepress links (November) and questioned whether Pantone works as an electronic color standard (May). The DTP section also provided sage advice on choosing a service bureau (May), handling registration problems and color proofing (July), auto-tracing and generating outline fonts (August), and choosing a type-manipulation program (see "Type" in the DTP section in this issue).

The page-layout market was also in high gear during 1990. In January our review of then-current contenders gave the nod to QuarkXPress over PageMaker and Ready,Set,Go!. At year's end, that recommendation stands, despite a plethora of upgrades and new products. Besides the impressive QuarkXPress 3.0 (reviewed in November), other new high-end releases we reviewed include PageMaker 4.0 (September), DesignStudio (June), and RagTime (June). In 1991 long-document publishing should finally gain a foothold on the Macintosh, thanks to Mac releases of FrameMaker (reviewed in November) and Ventura Publisher (scheduled for release this month).



Display Systems

In April we tested 19 monochrome Mac display systems. Apple's 15-inch Portrait Display was our first choice; runners-up included RasterOps' ClearVue, Sigma Designs' 19-inch L-View and 21-inch SilverView, and the Apple Two-Page Monochrome.

Our May Buyer's Guide examined 18 full-color display systems and gave a thorough technical overview of hardware and software variables that affect a purchase. Our small-screen favorites were the E-Machines ColorPage T16 and Apple High-Resolution RGB. Among the large-screen displays, we recommended the RasterOps 708+ Display and the SuperMac 19" Trinitron Color Display.

"The Golden Age of Gray Scale" (October) reported on tests of gray-scale display systems from CalComp, Radius, RasterOps, and SuperMac. All performed well, but the SuperMac 19" Platinum Display earned a five-mouse rating. Unless another vendor offers similar quality for less money, SuperMac will remain the gray-scale leader in 1991.



Graphics

The Macintosh's numerous graphics file formats — PICT, TIFF, EPS, and so forth — can be a major source of confusion. To help you sort it all out, we produced the "*MacUser* Guide to Graphics Formats," a pull-out poster in our September issue that contained

a comprehensive glossary of file formats plus extensively researched information about format compatibility and conversion capabilities for 43 applications.

In April we reviewed ten object-oriented drawing programs; our picks included Canvas for everyday use, FreeHand for type-intensive or mixed-format art, Illustrator for professional PostScript graphics, and Dreams for precisely dimensioned drafting. We also looked at Photoshop (July), a popular new color-retouching program. By early 1991, we should be seeing a new generation of graphics programs, including Illustrator 3.0, FreeHand 3.0, Studio/32, and some amazing new animation applications.



Money Management

In 1990 Mac software expanded its role in business accounting, especially for small- and moderate-sized companies. In March we analyzed five programs for preparing federal income-tax returns. MacInTax Federal 1989 earned a five-mouse rating for its wide selection of forms, worksheets, and tools; 1989 Personal Tax Templates, an inexpensive and customizable template package, was the runner-up.

In May we reviewed 17 accounting packages and made recommendations for one-write, corporate, and consolidated systems. Our picks included atOnce!, Mind Your Own Business, MultiLedger, Computerized Classic Accounting, and Insight.



OCR

Optical-character-recognition software now offers a wider range of "intelligent" features for text analysis. In July we examined the top contenders in OCR software and gave the highest marks to OmniPage, with AccuText running a close second. For high-volume scanning, we suggested looking at Calera's TopScan or Caere's Parallel Reader. More recently, Caere has announced Typist, a hand-held scanner with built-in OCR software that scans a page and exports the text directly to any active Mac application.



Printers

The past year saw better, faster color printing as well as higher-quality, less expensive black-and-white printers. In May we looked at the complex science of color printing — including inkjet, thermal wax transfer, and sublimal-dye thermal transfer — and analyzed software that translates PostScript images for non-PostScript color printers. We tested 14 color printers. The Tektronix ColorQuick was our favorite inkjet printer. The QMS ColorScript 100 Model 10 (with PostScript) was tops among thermal wax printers. The high-end Mitsubishi S340-10 wowed the crowd with sharp, realistic sublimal-dye colors (despite its $13,995 price and difficult setup).

In September MacUser Labs reviewed Apple's new line of personal laser printers and gave thumbs-up to the "classy, inexpensive" Personal LaserWriter SC and Personal LaserWriter NT. With increasing competition in the printer market, we predict even lower prices in the future.

For our October issue, we thoroughly tested 19 PostScript printers. The Texas Instruments microLaser PS35 came out on top in the personal-printer category. The Dataproducts LZR 1260i won our vote for both DTP and corporate use. We rated the higher-resolution Varityper VT600P best for camera-ready output that doesn't have to be "magazine quality." In "The Next Wave of Personal PostScript Printers," we previewed five soon-to-be-released PostScript contenders. We'll review these promising newcomers in upcoming issues.

In April MacUser Labs examined print spoolers — software that buffers LaserWriter and ImageWriter print files. SuperLaserSpool and SuperSpool topped the list (both are now sold by Fifth Generation). In November, we examined the latest in QuickDraw printers.



Scanners

"The Art of Scanning" in the May Color Buyer's Guide surveyed scanner techniques and technologies and examined data-compression, color-correction, and image-manipulation software. In September MacUser Labs took an inside look at 29 scanners in five categories: flatbed, sheetfed, overhead, hand-held, and slide models. The flatbed Microtek MSF-300Z proved best for color work, and the Agfa Focus II 800GSE topped the list for gray-scale scans. For very-high-resolution images, we chose the Truvel TZ-3 overhead scanner. Nikon's LS-3500 was judged the best slide scanner, and Thunderware's LightningScan emerged as the best hand-held scanner.



Charts and Statistics

In January we explained how to create drawings prevalent in business — organization charts, programming plans and procedures, and flowcharts. The three software packages reviewed — DiagramMaker, MacFlow, and TopDown — all earned four-mouse ratings. A recent upgrade may put TopDown at the head of the class, however; look for a review in an upcoming issue.

In April we looked at four heavy-duty statistical-analysis programs: Data Desk, Exstatix, JMP, and StatView. Citing the diverse qualities of these programs, we found no clear winner; instead, we recommended carefully matching their strengths to your needs. In November we followed up with a report on three high-end statistics packages. We liked SYSTAT for its Mac-like interface and SPSS for its wide range of functions, and we recommended Minitab for users with limited funds and hardware.



Storage

In 1990, the options for affordable mass data storage multiplied — as did the risks of losing data.

Magnetic Hard-Disk Drives. In February we examined the speed, reliability, service/repair options, and bundled software of 101 hard-disk drives with capacities of up to 100 megabytes. The Jasmine DirectDrive 40 and Microtech Nova 40, which both used the Quantum ProDrive 40S mechanism, were our favorites. Jasmine now sells its direct drive with a Fujitsu mechanism. Both Jasmine and Microtech sell their products by direct mail-order only. We recommended Apple's expensive 80-megabyte Hard Disk 80SC and the 40-megabyte Heart HD 1040 for people who prefer the convenience and security of buying from a retail outlet. In this issue, look for our picks in big, fast hard-disk drives (see "Moving Up to a Big, Fast Hard-Disk Drive").

March's "To the Rescue" showed you how to cope with disaster — floppy-disk- and hard-disk-drive crashes, data loss, corrupted desktops and drivers, and even dreaded SCSI termination.

Optical Drives. The year 1990 brought important news in optical media. Although read-only compact discs may slowly replace traditional book libraries, erasable optical discs now offer the most economical mass storage option.

In March we reviewed six CD-ROM players. The CD Technology Porta-Drive and the more expensive Toshiba XM-3201 A1 MAC rated four-and-a-half mice. Apple's AppleCD SC and Optical Media International's OMI ProCDP rated slightly lower. Our conclusion: "Speed will improve in the next few years, but it will never approach that of hard drives or nonstandard optical media." That is, CD-ROM has emerged as an effective distribution medium but is not as practical in daily data retrieval as are other media.

In November we tested 20 erasable optical drives. The fast FWB HammerDisk 600S and the Storage Dimensions MacinStor were our favorites. The drives we tested showed that cost-effective erasable optical technology has arrived. Next year will bring a battle between them and the established, lower-capacity SyQuest removable-hard-disk drives.

Floppies. Macs have learned to read DOS disks, including the high-density 3.5-inch variety. In February we tested four drives that read high-density IBM and Mac floppy disks. The now-standard Apple FDHD SuperDrive tied with the Kennect Drive 2.4 (with Rapport controller) for first place. The popular DaynaFILE drive was a close second (Dayna's DOS Mounter software also lets the Apple and Kennect drives appear as Finder icons).



Telecommunications

Modems are going from fast to faster, but the fastest aren't necessarily reliable or even compatible with each other. In January, MacUser Labs subjected eleven 9,600-bps modems to an exhaustive suite of tests. The winners were the CONNECT V.32 Service, Racal-Vadic 9632VP, and U.S. Robotics Courier V.32. We also revealed that Microcom, Farallon Computing, and other manufacturers would soon offer lower prices and built-in ISDN (Integrated Services Digital Network) capability.

In July we surveyed the overall performance of five electronic-mail software packages for all-Mac or mixed networks — QuickMail's extensive feature lists gave it a narrow edge over Microsoft Mail — and explored the mysteries of routers, bridges, and gateways.

"On the Line with *MacUser*" (July) was a friendly introduction and complete user's guide to Zmac, the CompuServe on-line resource for *MacUser* and *MacWEEK*. Reviews of telecommunications software also appeared in March (America Online and Prodigy), May (White Knight), and June (MicroPhone II).

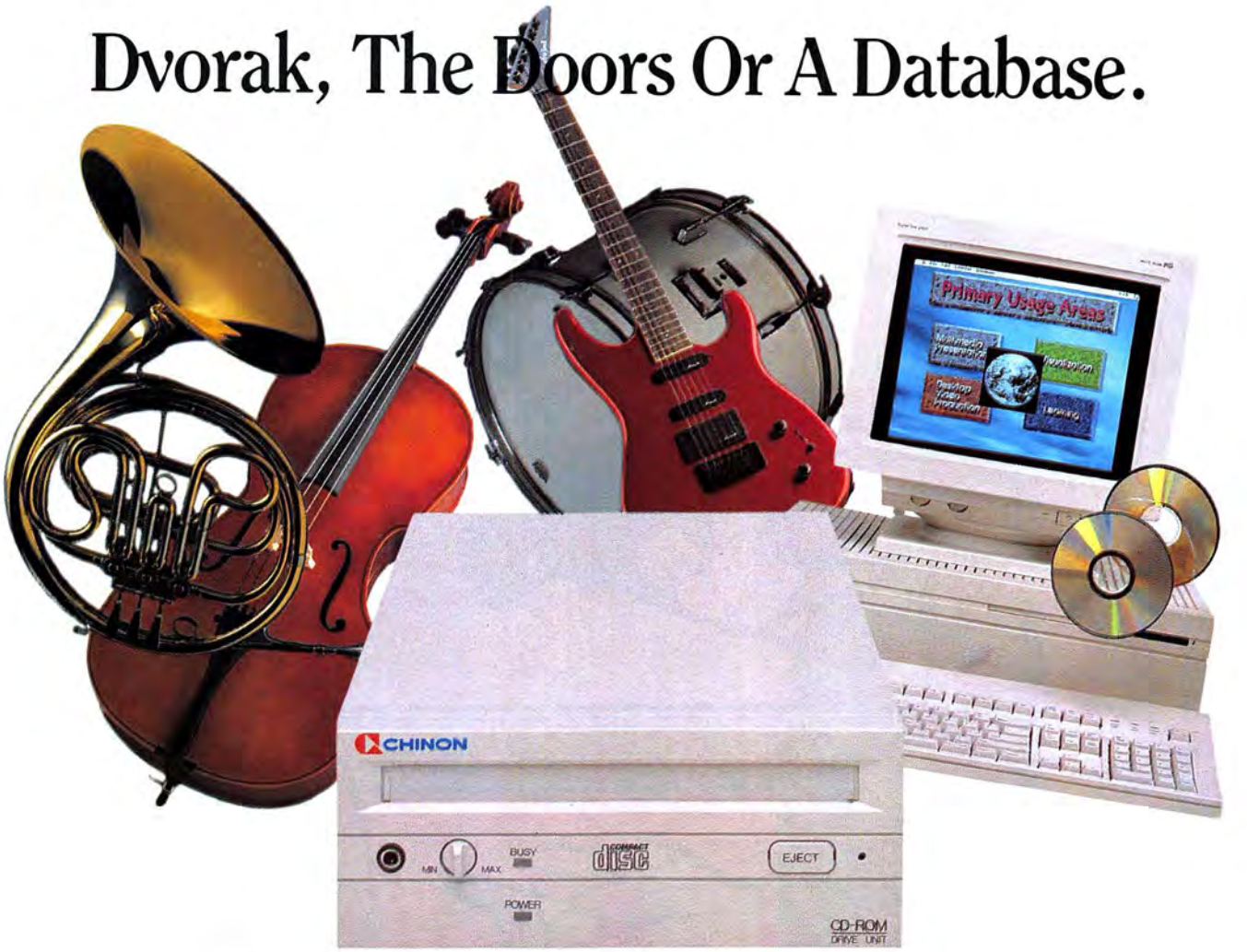


Word Processors

Just when you thought that Mac word-processing programs were all grown up, developers borrowed features from page-layout programs, databases, and utilities. When we took a detailed look at Mac word-processing programs in February, Microsoft Word and Nisus shared top honors. During 1990, our Power Tools section revealed ways to increase your word-processing productivity — see Power Tools in June, July, August, September, and this issue.

Looking Ahead. What's new for '91? With the introduction of System 7.0, expect to see applications that transparently share data (and a lot of books on System 7.0). Voice input should also be hot — it'll let you do things such as add spoken memos to your files. And 1991 may be when we see a new lighter Mac portable and a workstation-quality 68040 CPU.

Dvorak, The Doors Or A Database.



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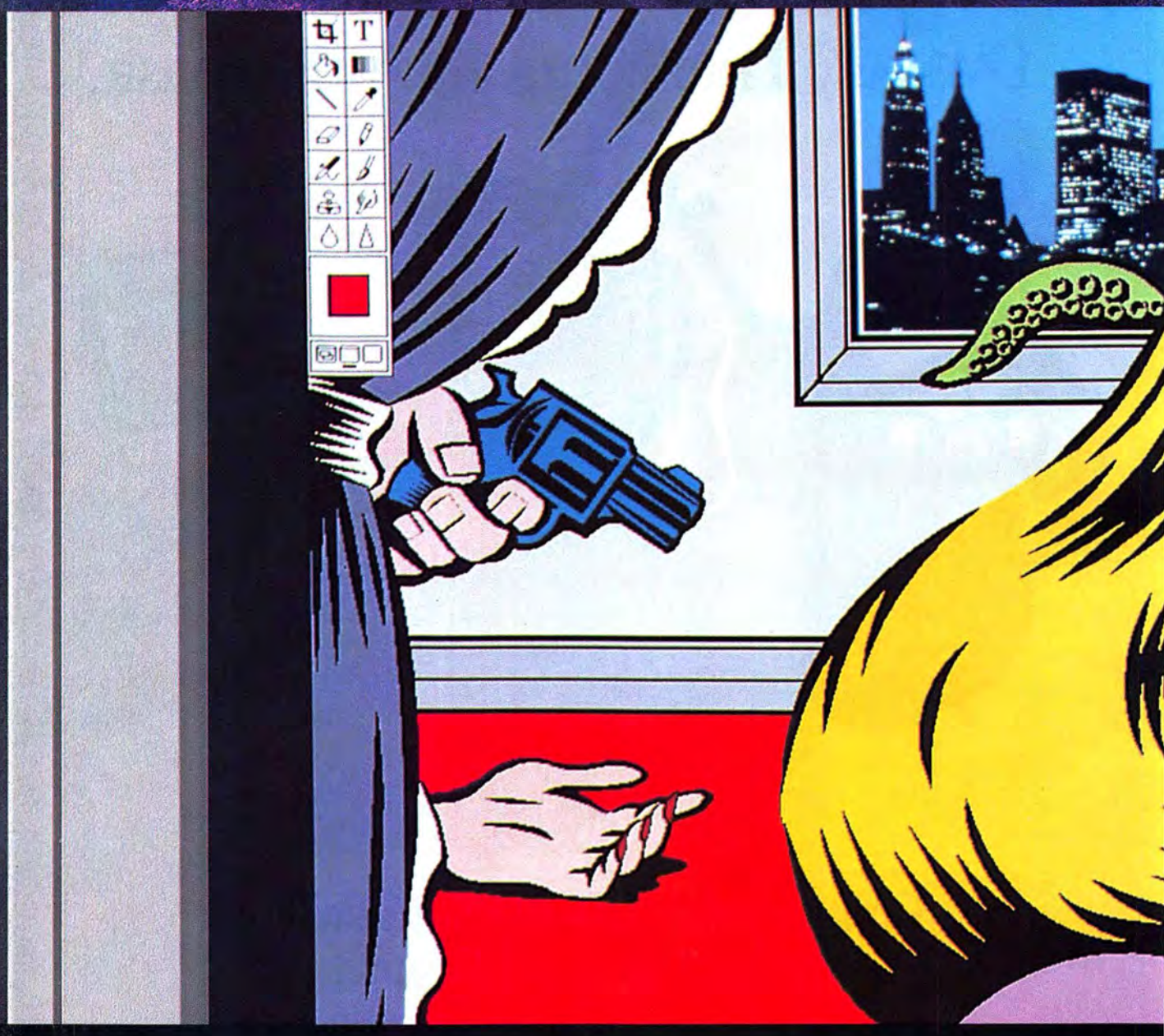
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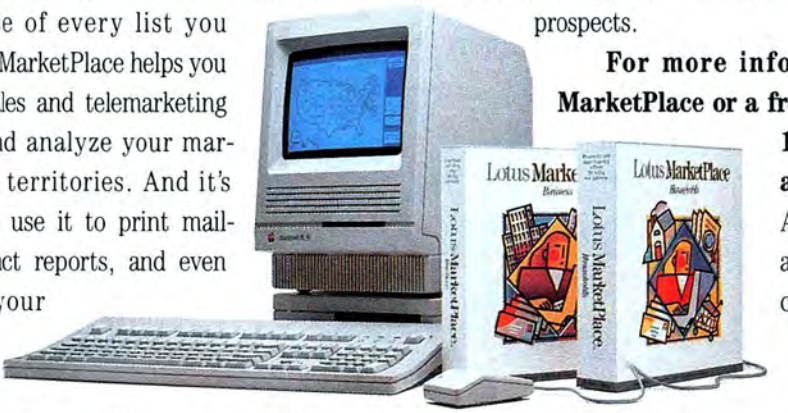
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MacUser's *Reader Survey uncovers the likes and dislikes — and machine muscle — of the typical Mac user.*

OUR READERS WRITE BACK

Earlier this year, *MacUser* asked readers to complete a survey that included such simple questions as "What software do you use?" and "What would you do if you ran Apple?" (May '90, page 275). We reported some of the responses in previous issues (see "Special Delivery," August '90, page 12, to see what advice readers would like to give Apple). Now here's a chance to see what "typical" *MacUser* readers are like — what kind of Macs they use, how often they use their Macs, and what issues they think will matter to Apple and Mac users in the '90s.

By Victoria von Biel

PHOTOGRAPHY: TOM UPTON

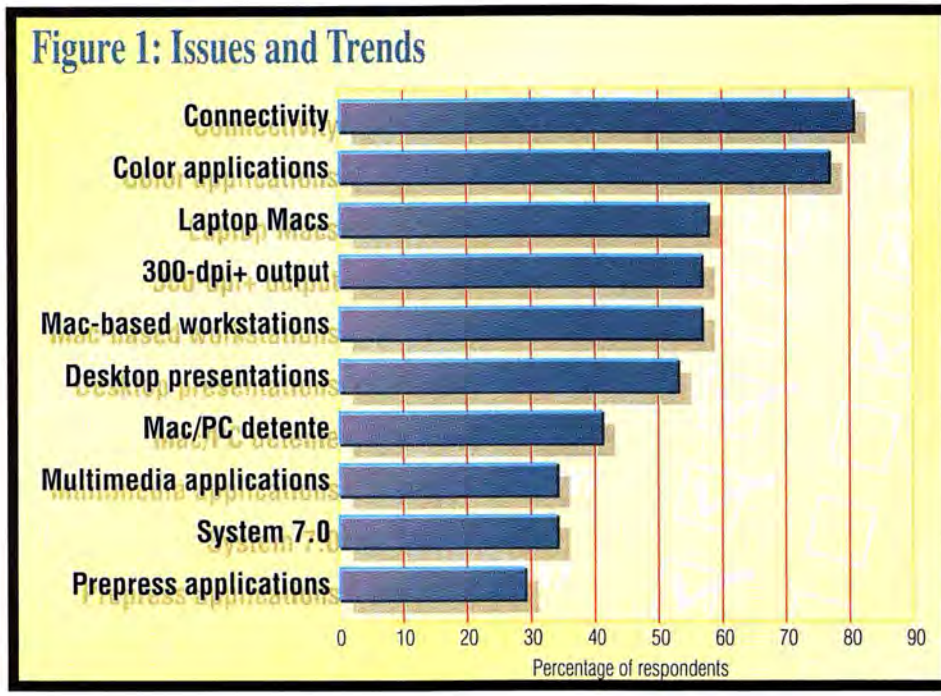


Figure 1: Which issues and applications will make a real difference in the Mac marketplace? Our readers voted for connectivity and color applications. Reaction to the long-awaited release of System 7.0 was more muted.

We culled these responses from close to 1,000 surveys. We make no claims about scientific polling methods or statistical accuracy in compiling the results; these figures reflect only the views of those readers who chose to respond. With these caveats in mind, read on to see whether you recognize the "typical" Mac user.

MacAverage

One thing we can report with the utmost reliability: The *MacUser* reader does not suffer from false modesty. More than a fifth of the respondents (21 percent) consider themselves Mac "gurus"; a hefty 58 percent think of themselves as "power users"; 15 percent categorize themselves as "hackers/developers." Fewer than 5 percent think of themselves as "novices," although one respondent — a little confused but on the right track — labeled herself a "novice power user." (See the "More Than You Know?" sidebar to discover how *you* rate.)

Nor do these Mac aficionados slack off when it comes to taking care of business. A large majority of respondents (75 percent) use a Macintosh at home *and* at work. The average amount of time spent using their Macs came to a whopping 30.5 hours per week.

And what kind of machine does our average reader have? Forty-two percent use a modular Mac (the Mac II line), but a larger group — 48 percent — use the compact Mac Plus, SE, or SE/30; 2 percent said they used the Mac Portable most often. (Neither the IIfx nor the new CPUs reviewed in this issue were on the market when we conducted the survey.) Respondents also demonstrated that they're not skimping on memory and storage. The average amount of RAM came to 4.5 megabytes — more than many *MacUser* editors have! — and the average amount of hard-disk space was 65 megabytes.

Software Hit Parade

There were no surprises when it came to the software our readers use — the top three applications are word processing (used by 97 percent of the respondents), drawing (85 percent), and spreadsheets (82 percent). More unexpected is that a third of the respondents use some sort of programming tool — a reflection, perhaps, of *MacUser* readers' sophistication.

Besides the Big Three applications, the top categories are painting (76 percent), utilities (74 percent), databases (68 percent), telecommunications (66 percent), and page layout (62 percent). It's not all work, however. Forty-two percent of the respondents enjoy entertainment packages, and 20 percent said they use music or multimedia applications. However, the age of artificial intelligence has yet to reach the Mac — only 1 percent said they work with expert systems or artificial-intelligence software.

We also asked respondents to rate the companies they deal with. As expected, large companies with lots

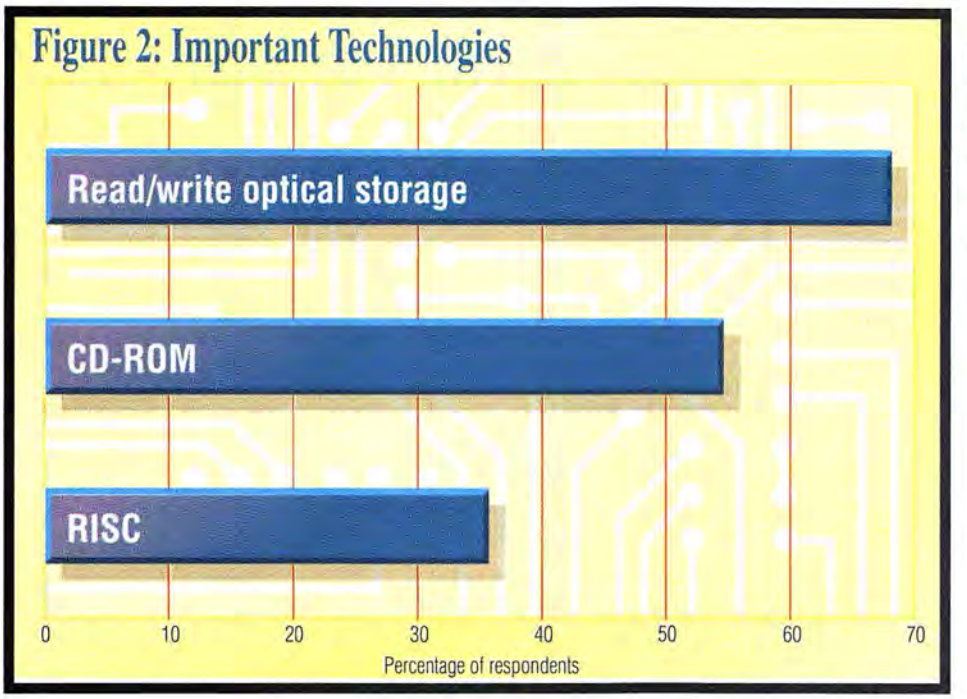


Figure 2: In assessing the impact of emerging technologies, survey respondents indicated that read/write optical storage would make the most difference in the years ahead.

of products, such as Microsoft and Aldus, came out on top. There was a pleasant surprise in the business-software section, however: Intuit, whose only program is the personal-finance package Quicken, placed third in popularity after giants Microsoft and Claris.

Opinions, Opinions

Readers were not shy about offering ideas for ways in which Mac products could be improved. One respondent suggested, "All programs should have better manuals or training methods. The great programs now available require training, because it's too hard to just insert the disk and learn as you go."

An obviously disgruntled Mac user said, "Telecommunications programs need a preprogrammed function for sending complaints to John Sculley." Another reader wrote that "Apple or Claris should develop a modular programming system that would let you combine PageMaker with Illustrator or QuarkXPress with FreeHand and Microsoft Word." And one respondent has a product idea that would probably make millions: "I'd like to see a 'canary' utility that could predict system bombs and help prevent them."

Which issues and trends are going to make a difference to Mac users in the long run? Our readers voted for connectivity, color applications, and laptops (see Figure 1 for a complete rundown on how respondents ranked the issues). As for technologies, read/write optical storage was a surprise big issue (see Figure 2). CD-ROM and the impact of RISC on CPUs had a strong showing as well.

And the Winners Are . . .

As we promised, ten survey respondents will receive a library of computer books published by Microsoft Press. The winners are: Deborah Burcham of Newark, Delaware; Robb Wesche of Grand Rapids, Michigan; Bradley H. Martin of Lowelville, Ohio; Patti Arredondo of Findlay, Ohio; Rick Bush of Gainesville, Florida; Lori Martin of North York, Ontario, Canada; Brian Will of Vernon, Connecticut; O.I. Ford of Boulder Creek, California; Joe Seale of Fredericksburg, Texas; and John B. Hudson of Idaho Falls, Idaho.

Each of the winners will receive *The Apple Macintosh Book* by Cary Lu; *The Big Chip* by W. R. Philbrick and Bruce Jensen; *Computer Lib/Dream Machine* by Ted Nelson; *Desktop Publishing by Design* by Ronnie Shushan and Don Wright; *Excel in Business* by the Cobb Group; *Inside SuperCard* by Andrew Himes and Craig Ragland; *Learning with Interactive Multimedia,* edited by Sueann Ambron and Kristina Hooper; *Microsoft Works for the Apple Macintosh* by Charles Rubin; *PowerPoint Presentations by Design* by Roger C. Parker; and *Working with Word* by Chris Kinata and Gordon McComb.

Congratulations to the winners, and our thanks to Microsoft Press for supplying the prizes.

More Than You Know?

If you're among the 21 percent of *MacUser* readers who classify themselves as Macintosh gurus, here's a little quiz that should be a breeze. These trivia questions are taken from the first Boston Computer Society's Macintosh Jeopardy! tournament, held last August. As with the perennial TV quiz show, the gimmick is that the answers to all the questions (in a variety of categories) are provided — you just need to come up with the questions. Score one point for each correct question; the questions and a scoring key are shown below.

Menu Bars

In this category, you must identify the program with the main screen that shows the following menu bars:

1. File, Edit, View, Special

2. File, Edit, Goodies, Font, FontSize, Style

Mac Math

3. Of the Mac SE, the Mac IIcx, and the Mac IIx, it's the only machine whose number of expansion slots is not a prime number.

4. The number of years between the Mac's earliest possible clock date and the year the Mac was publicly introduced.

Easter Eggs

Easter eggs are hidden dialog boxes and other undocumented goodies that software developers leave as little surprises for savvy users (and irate product managers).

5. This word processor's least-professional feature is a secret command that translates English into pig Latin — but it's only in the beta version.

6. If you play this arcade game on December 25, you'll find that the Black Knight has planted a Christmas tree in the grand hall of his castle.

7. Your Mac Plus displays this incriminating message if you press the programmer's switch and type `G 40E118`.

8. The first release of MacPaint version 2.0 contained a hidden picture of a zebra-woman, which was scanned from a cover of this comic magazine.

Mac in the Movies

9. *Robocop II*'s killer android sports a user interface that is identical to the Mac's, except that the Apple menu has been replaced with this symbol.

10. This Macintosh model is such a classic that it's being sold as a valuable antique in *Back to the Future, Part II.*

11. This Mac-produced animated film showed the antics of a MacPaint tool on a real desktop.

Jobs, Woz, or God

In this category, you must identify the source of the quotation as Steve Jobs, Steve Wozniak, or the Bible.

12. "We want people to use really great computers, and one way to do that is to make them, which we do."

13. "Dreams come true through lots of business; you want to be a fool, you do it through lots of words."

14. "You've never heard about what operating system the Mac runs because nobody thinks about it."

15. "Happiness is the only thing life's about... you don't do anything in life unless it's for happiness."

Non-Mac 'Macs'

16. Apple changed the spelling of the Mac's name after threats of litigation from this stereo company.

17. Shakespeare described this tragedy as "A tale told by an idiot, full of sound and fury, signifying nothing."

18. According to Betty Crocker, you need sugar, egg whites, almond extract, and coconut to whip up a batch of these cookies.

Prehistoric-Period Programs

19. To help lure John Sculley to Apple in 1982, Andy Hertzfeld wrote a Macintosh graphics demo featuring jittering bugs, dancing Macintoshes, and a twirling group of bottle caps from this beverage.

20. This 1982 program — the only Mac arcade game Apple has ever marketed — combined *Alice in Wonderland* with the heart-stopping excitement of chess.

Viruses

21. It was the first virus written in HyperTalk. It's also the only known virus named after a presidential candidate.

22. This virus will hardly create industrywide mayhem; it infects only Atari STs running Mac-emulation software.

23. At least this virus entertains you as it infects you; it causes your mouse pointer to ping-pong wildly around the screen.

24. If your computer unexpectedly shows you a dialog box that says, "Don't Panic!" you *should* — you've just been infected by this virus.

Macintosh Potpourri

25. A feature story in the first issue of *MacUser* was a comparison between these two then-popular spreadsheet programs.

26. This former Apple celebrity once said, "[In a Mac company] T-shirts aren't worthless trinkets; they're part of the development process."

27. The Macintosh hardware supports the use of 281.5 trillion of these, but software imposes a limit of 16.8 million.

28. It's the only standard Apple system font with the same name as a type of Pepperidge Farm cookie.

29. Of a Macintosh Portable, a Macintosh IIfx, or a Cray II supercomputer, this one costs the most per pound in its minimum configuration.

30. Apple manager Mike Scott established January 1, 1981, as the deadline for eliminating all these machines from Apple's offices.

— Andy Ihnatko

Questions

1. What is the Finder?
2. What is MacPaint 1.0?
3. What is the Mac IIx? (with six slots)
4. What is 80? (1904 – 1984)
5. What is FullWrite Professional?
6. What is Dark Castle?
7. What is "Stolen from Apple Computer"?
8. What is *Heavy Metal*?
9. What is a skull?
10. What is the Mac 128K?
11. What is *Pencil Test*?
12. Who is Jobs?
13. Who is God? (Eccl. 5:3)
14. Who is Jobs?
15. Who is Woz?
16. What is McIntosh?
17. What is Macbeth?
18. What are macaroons?
19. What is Pepsi?
20. What is Through the Looking Glass?
21. What is the Dukakis virus?
22. What is Frankie?
23. What is Zucchini?
24. What is nVIR?
25. What are Jazz and Excel?
26. Who is Guy Kawasaki?
27. What are colors?
28. What is Geneva?
29. What is a Mac IIfx? ($340, $373, and $350, respectively)
30. What are typewriters?

Scoring

Give yourself a point for each correct question. Here's how to tell how close you are to Mac gurudom:

Fewer than 5 correct: You've never read even a page of *Inside Macintosh* — you've probably never even *heard* of *Inside Macintosh.*

5 – 15: You've *heard* of *Inside Macintosh,* but you're waiting for the movie.

15 – 20: Not bad. Most likely, you're a basically healthy Mac user whose frivolous activities and interests — such as a job, a family, or a social life — keep you from reading *Inside Macintosh* as much as you'd like.

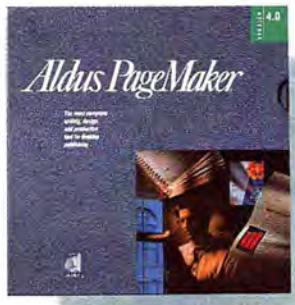
20 – 25: You're a veritable font of Mac wisdom — or you're pretty good at reading upside-down text.

25 – 30: OK, Smarty-pants, so *you* make up the quiz next time!

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Short steps for long documents

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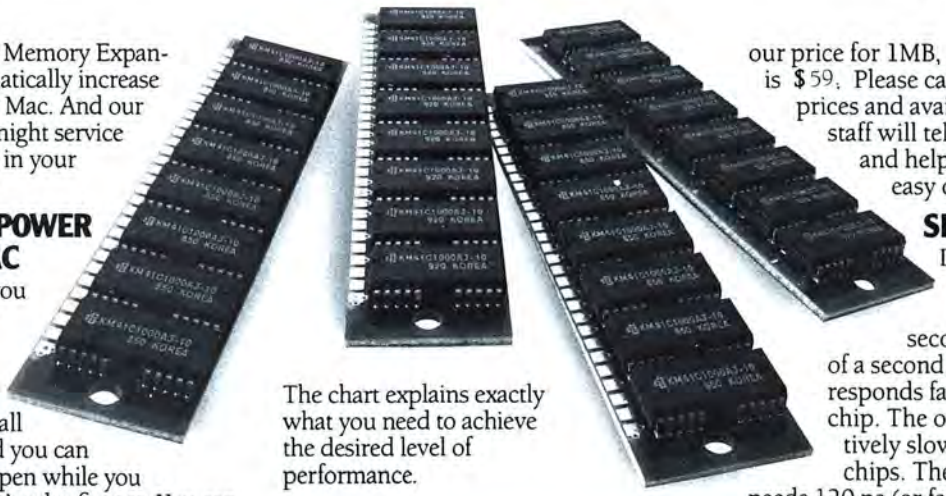
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Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs — (2@$59 each).





The chart explains exactly what you need to achieve the desired level of performance.

To upgrade a 4-socket Mac Plus or SE to this amount of memory	Do this: (install in multiples of two only)
2 MB	Remove all four existing 256K SIMMs, install two 1M SIMMs, leave two sockets for future expansion.
2½ MB	Remove only two 256K SIMMs, install two 1M SIMMs.
4 MB	Replace all four 256K SIMMs with four 1M SIMMs.
To upgrade an 8-socket Mac II, IIx, IIcx, or SE30 to this amount of memory	**Do this: (install in multiples of four only)**
4 MB	Remove all four existing 256K SIMMs, install four 1M SIMMs, leave remaining sockets for future expansion.
5 MB	Keep existing 256K SIMMs, install four 1M SIMMs in remaining sockets.
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To open your Mac Plus or SE, you'll need a specially designed tool – it's available from us as part of a handy tool kit for just $9.

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Do you need 80, 100 or 120 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor needs 120 ns (or faster) chip, and the 68030 Macs like the speedier model.

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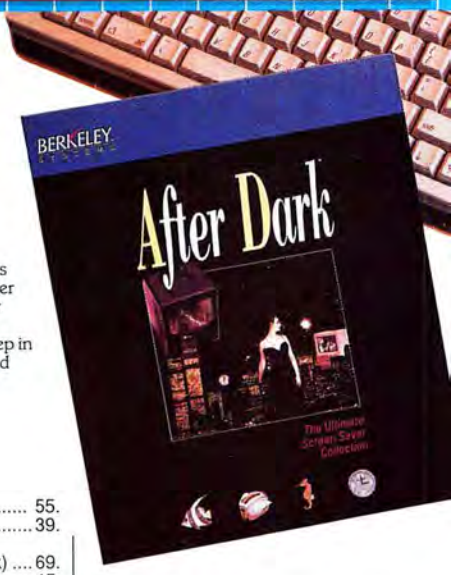


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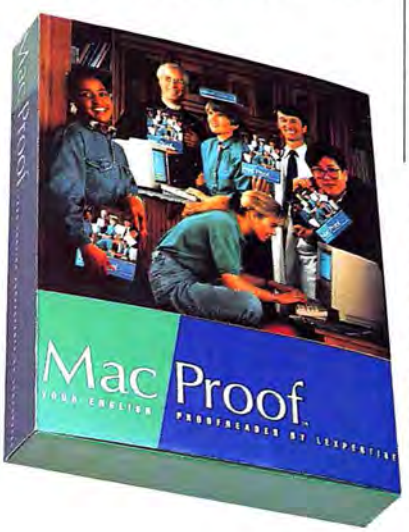
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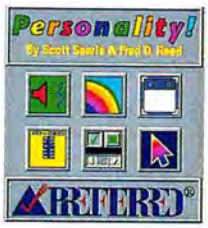
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Icon-It! 2.1
An icon is worth a thousand menus! Don't waste time fumbling through rows of menus to find program commands. Just click on the appropriate always visible Icon-it! icon and set the command in motion. Use the supplied icons or design your own. **$45.**



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Fly WWII's best fighter plane, the P51 Mustang. Dogfight German Me109s, strafe ground targets, buzz the Eiffel Tower, fly with or against another connected Mac. Watch action from 13 different camera angles. You can even see a replay of the last few minutes action. P-51 IS NOW IN COLOR! **$31.**



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Customise the sights & sounds of your Mac. Use personality to assign asynchronous sounds to systems events, control colors in menus, windows, scroll bars, borders, buttons and more. Sets any font size to menu bars and items. May be turned on or off on a per application basis. **$53.**



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Fox Software
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Odesta
Double Helix 3.5 389.
Record Holder Plus 3.1 65.

DESK ACCESSORIES

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Dubl-Click
Calculator Construction Set v. 2.0 45.
JAM Software
Smart Alarms & Appt. Diary 64.
Smart Alarms (1 - 4 users) 125.
Smart Alarms (5 - 8 users) 189.
Smart Alarms (9 - 15 users) 249.
Smart Alarms (16-25 users) 375.
Microlytics
Inside Information 69.
Preferred Publishers
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Pamper your Mac with a Targus case made of Zilicone treated nylon to give you waterproof durability and an impact absorbing high-density foam layer with a soft protective lining for complete protection. Cushioned shoulder pad and handles provide extra comfort and convenience. There's room for everything from your Mac, a hard disk drive, and the extended keyboard to pockets for your mouse, floppies, cables, and pens. (accessories) **$ 69.** Full Mac line available in black. Some styles available in blue, burgundy, and platinum. **Premier Leather Case** now available (black). **$ 175.**

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Letra Studio 275.
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Dayna File Single 360K (5 1/4") 525.
Dayna File Dual 360K & 1.44M 749.
Daystar
FastCache IICI 299.
Fujitsu
800K Floppy Drive 149.

ResumExpert (A Lasting Impression)
Whether you're seeking an entry-level position or an executive's corner office, the ResumExpert Software Series is the next best thing to knowing the boss. Professionally written and fully-formatted Microsoft Word templates let you easily create eye-catching resumes. MacUser 10/89 awarded ResumExpert 4 mice and raved about the "excellent manual" that includes expert writing tips. MacUser 12/89 rated it as one of the Top 200 Software Programs of 1989. See line listings for all 10 editions. (business) **$49. each**



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Map Art PAINT 45.
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HyperCard or Pagemaker 3.0 ea. 35.
Word 4.0 Video Tape 35.

ENTERTAINMENT

Artworx
Bridge 6.0 29.

T-Script v1.3 (TeleTypesetting Co.)
T-Script allows you to output PostScript text and graphics from any Macintosh application. It drives a variety of non-PostScript printers such as HP laserJet, Deckjet, DeckWriter, PaintJet, Apple LaserWriter SC and ImageWriter, GCC PLP, Cannon LBP and Bubble Jet series, and more. T-Script supports Adobe Type I and Type III fonts as well as 24 bit color. It is AppleTalk network compatible and Chooser accessible (under Multifinder). Includes PostScript laserWriter compatible fonts, PostScript editor and screen preview. (utilities). **$95.**



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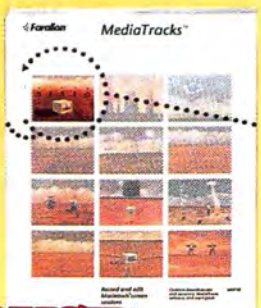


Freedom of Press Light 3.0 (Custom Applications, Inc.)
Now output to non-PostScript devices from applications such as PageMaker, Illustrator and Quark XPress. Freedom of Press Light supports such printers as the HP LaserJet II, IIP,III, DeskWriter and PaintJet as well as all Apple, GCC or HP QuickDraw printers. Includes 17 scalable, rotatable PostScript fonts and support for additional fonts including Adobe Type 1. Compatible with all Macs. (utilities) **$255.**

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Includes 35 fonts, supports more than 50 black and white and color printers. (utilities) **$225.**



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No more need to waste time repeating instructions, just use MediaTracks to tape a common Mac procedure once, then let people watch it at their convenience. This ingenious program lets you record whatever takes place on your screen so your audience can watch tapes of that activity just as it appeared. Use its full set of tools to edit and annotate tapes or use it in conjunction with MacRecorder to add clarifying narration. (communications) **$189. Multimedia Pack $319. CD ROM $319.**

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3 in *Three* is a rarity...a totally original concept that combines interactive storytelling and puzzle solving in a way never before realized on a Mac. 3 in Three features 80 head-scratching puzzles and 60 animated scenes. **$33.**



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As NATO Task Force Commander you must deploy subs, ships and aircraft to locate, engage and defeat the Soviet's northern battle fleet, poised and awaiting your next move. At your disposal are a database of over 100 NATO and Soviet weapons systems, a Staff Assistant and more. **$39.**

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Mouse Pads (Computer Giftware)
For sophistication during hours-and excitement after! **Executive Pads** put the elegance of marble on your desk. Choose from White Italian Marble, Green Marble, Granite, and even Kentucky Burlwood. After the grind why not invite a Bikini-clad California Girl or Volley Ball Hunk over to your **Bachelor or Bachelorette Pad**? **$12.** The truly daring may even opt for an exciting **Indiana Jones** adventure. **$13.** MacWarehouse is now your exclusive mailorder source for new **Mickey Mouse** & **Dick Tracy** mouse pads! **$13.** (accessories)

Silicon Beach
Digital Darkroom 2.0 248.
Super 3D 2.1 339.
SuperPaint 2.0 135.
Solutions, Inc.
Curator 87.
Somak
LaserArt CD-ROM #1 or #2 ea. 62.
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Art Clips Vol. 1 or Vol. 2 Call.
T/Maker
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EPS Illustrations 82.
Business Cartoons 33.
Zedcor
DeskPaint 3.0 and DeskDraw 115.

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Hewlett Packard
HP DeskWriter 779.
MegaGraphics Display Systems
Rival 2001 System for Mac II 1269.
Rival 3001 System for Mac SE/30 . 1269.
Rival SE System for Mac SE 1269.
Rival Plus System for Mac Plus 1310.
19" Color 2008 Hi-Res/Mac II 4459.
16" Color 2008 Hi-Res/Mac II 3495.
Grayscale 2008/Mac II 2195.
Grayscale 3008/Mac SE/30 2195.
Microtek
Microtek MSF-300GS Scanner 1589.
Microtek MSF-300ZS Scanner 1998.
NEC (Full line available)
Intersect CDR-35 399.
Qume
Crystal Print Publisher II 2900.
Seikosha America
Seikosha Printer (dot-matrix) 235.
Sharp (full line available)
The Wizard - 7000 219.
The Wizard OZ 7200 (64K RAM) 255.
ThunderWare
LightningScan 400 385.
ThunderScan Plus 199.

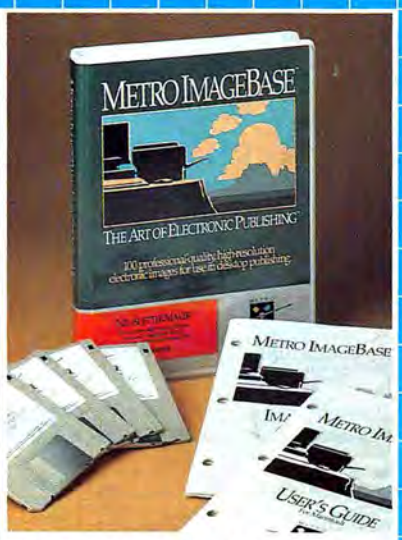
HYPERWARE

Bantam
Complete HyperCard Handbook 22.

Beacon Technologies
HyperBible International Version 175.
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DataDesk International
HyperDialer 32.
MicroMaps
HyperAtlas 59.
Silicon Beach
SuperCard 1.5 205.
Symmetry
HyperDA 1.2 45.

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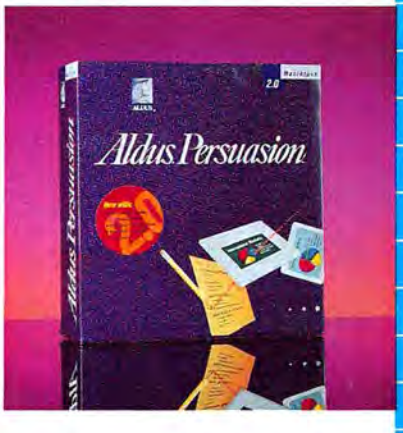
Altra
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Mirage Adaptor 35.
Roller Mouse ADB 75.
DataDesk Intl.
DataDesk Switchboard 175.
Mac 101 Keyboards 129.



Metro ImageBase Electronic Clip Art (Metro ImageBase)
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Kensington
New Turbo Mouse 109.
Keytronic
MacPro Keyboard 118.
Koala
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Kraft
ADB Joystick Premium III (SE&II) 49.
QuickStick 39.
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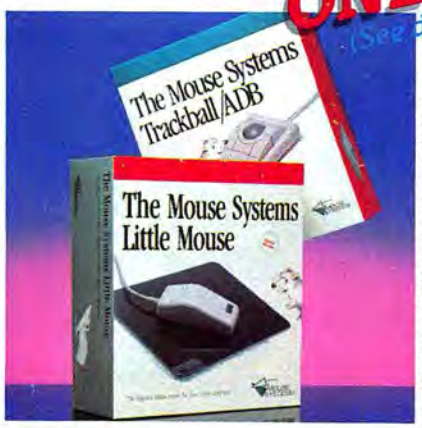
Persuasion 2.0 (Aldus)
Persuasion streamlines the process of creating desktop presentations. Just type your ideas into a pre-defined outline template and Persuasion automatically prepares your slides. Emphasize important points with any of its pre-defined charts and graphs. Give the command and Persuasion will format speeches to match presentations and even print audience handouts. Use its slide show mode to make smooth, professional presentations. Persuasion comes with 15 different wipe/dissolve effects and includes drivers for most popular printers and film recorders. (business). **$329.**



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LYNX Turbo Trackball 59.
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The UnMouse 189.
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TrackBall ADB 69.
Little Mouse 75.
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Smalltalk/V MAC 125.
Shana Corporation
Inside Out 369.
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THINK'S C 4.0 or Pascal ea. 165.
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Primera Software
Different Drummer 59.
Repertoire
Music Publisher 359.
Resonate
Listen 2.0 62.
Tactic Software
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MaxFax 309.
2400 MFax 209.
ProModem 2400 SE Int. 209.
ProModem 2400M 199.
ProModem 2400M II 205.
Travel Modem 205.
Supra
Supra Modem 2400 119.

MUSIC AND SOUND

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STATISTICAL ANALYSIS

Abacus Concepts
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StatView SE+Graphics 179.
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Wolfram Research
Mathematica (SE) 450.

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Use this powerful forms management system to quickly create, customize, fill, save, archive and print professional quality custom business forms. Then import and export data into user defined fields to perform automatic calculations. **$105.**

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MacPrint 95.
Magic Software
AutoSave II 28.
BackMatic 50.
Mainstay
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MacFlow 3.5 125
Preferred Publishers
Personality 53



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CE Software
Alarming Events 85.
QuicKeys 2.0 64.
Caere
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WORD PROCESSORS & OUTLINERS

Claris
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RightSoft
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Tactic
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T/Maker
WriteNow 2.2 119.
WordPerfect Corp.
WordPerfect Call



FileGuard 2.5 (ASD Software)
"FileGuard stands out, especially for corporate users." MacUser May, 1990 Issue
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Bitstream Typeface Library *2.0* for the Macintosh

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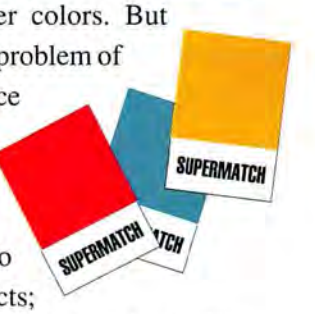
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PMUG is a new national user group dedicated to PageMaker. Membership benefits include subscriptions to several PageMaker-specific publications, discounts on Aldus technical and design seminars, and an open channel to fellow users and Aldus. Dues are $45 ($30 if you belong to the National Association of Desktop Publishers). To join, call (800) 874-4113, ext. 25.

By Aileen Abernathy

SuperCalibration: One of the biggest headaches in desktop color is calibration — ensuring that the color you see on-screen matches what appears on paper. Radius and Barco both offer products that color-correct monitors, and Tektronix's TekColor calibrates monitor and printer colors. But neither technology provides a complete solution to the problem of WYSIWYG color. Now SuperMac is about to introduce SuperMatch, the first system that calibrates both spot color and continuous-tone color from scanner to monitor to printer. Unlike its competition, SuperMatch is an open system, allowing any company to provide the necessary data for support of its products; participating vendors include Agfa Matrix, Barneyscan, Howtek, Kodak, Nikon, QMS, and Sharp. SuperMatch has two parts: the Display Calibrator, a $699 luminance sensor (à la Radius and Barco), and the SuperPicker cdev (bundled free with SuperMac video boards), a replacement for Apple's Color Picker that uses the TekColor technology.





Publications for publishers: Agfa Compugraphic's *An Introduction to Digital Color Prepress* is an excellent primer on desktop-based systems that contains nary a sales plug for Agfa products. The booklet's clear explanations and excellent illustrations will benefit prepress novices and seasoned veterans alike. To get your free copy, call Agfa's Marketing Communications department at (508) 658-5600. ❖ The hottest newsletter on the DTP circuit is *MacPrePress*, faxed out weekly by Steve Hannaford and *MacUser* contributing editor Kathleen Tinkel. Its practical advice is liberally seasoned with juicy gossip and inside scoops that keep the industry buzzing. A one-year subscription is $250; to order, call (203) 227-2357 or fax (203) 454-4962.

Letraset lowers lists: Letraset has slashed prices in an effort to revive its stalled Studio line of graphic-design software. ColorStudio has been marked down from $1,995 to $995 — the better to compete with Photoshop — and the new Shapes Annex, which adds text and drawing tools, will be bundled free through January 1, 1991. ImageStudio 1.5, now $250, should give Digital Darkroom 2.0 a run for the (gray-scale) roses. ❖ The venerable Ready,Set,Go! has been repositioned as an "entry level" page-layout program and given a price tag to match ($295). This places RSG! — originally marketed as a high-end solution — in the same ballpark as Publish It! Easy and Personal Press. ❖ On the flip side, Letraset appears to be giving up on StandOut!, once considered the most promising presentation product. It's still sold on request, but Letraset has no plans to upgrade or actively market the program.

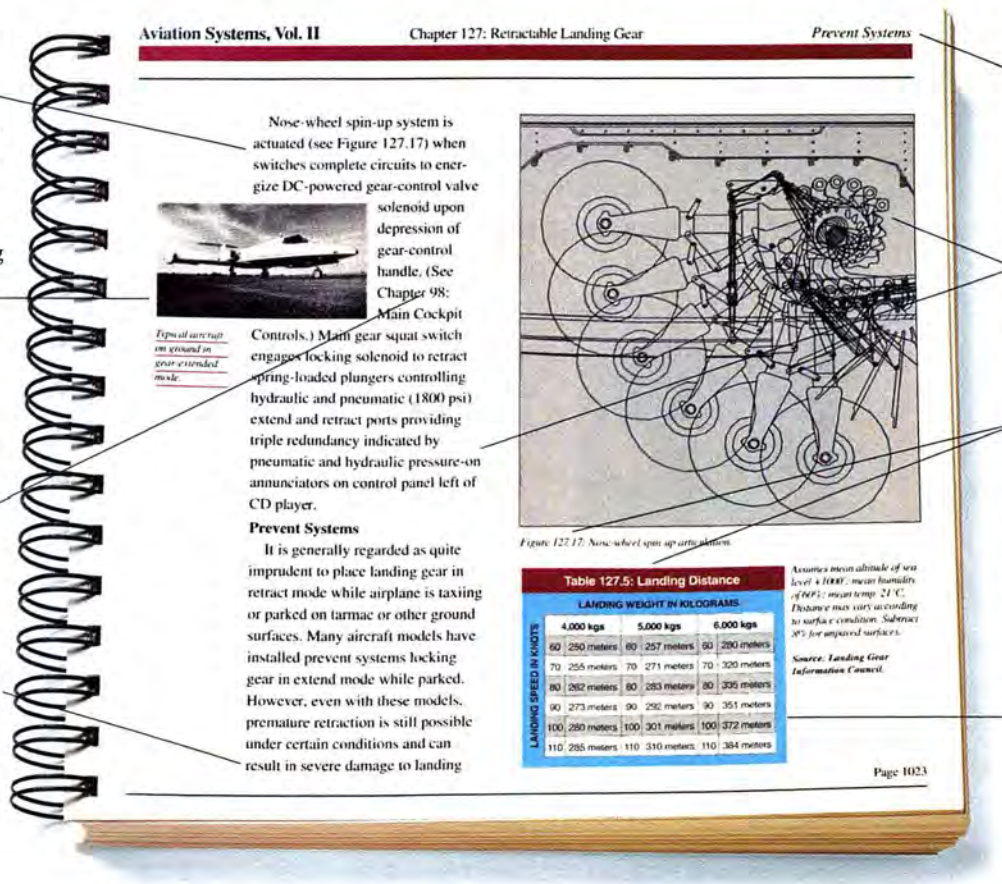
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Twisting, Shouting Type

Whether you're a part-time publisher or a full-time designer, you'll find that creating unique display type has never been easier.

By Eric Taub

Not long ago, about the most imaginative thing you could do with type on your Mac was to rotate it or set it on a circular or irregular path, using a program such as Adobe Illustrator or Aldus FreeHand. But in the past year or so, three programs have emerged for which such feats are child's play. Adobe's TypeAlign, Brøderbund's TypeStyler, and Letraset's LetraStudio all let you rotate, skew, stretch, distort, and otherwise "empretzel" type to create distinctive logos, headlines, and display type. All these programs let you manipulate type, but each has different features and requirements, not to mention price tags. Whether you want to liven up a newsletter or need to create logos and display type on a daily basis, this article will help you pick the type-manipulation program that best suits your needs.

TypeAlign 1.04

Adobe's TypeAlign ($99) is the simplest — and least expensive — of the type-manipulation programs (see review, May '90, page 55). It's a DA that works on any Mac from a Plus on up, as long as you also have Adobe Type Manager (also $99) installed. TypeAlign does its font rendering on the fly, using a combination of its own INIT and ATM. As a result, it works only on fonts that are compatible with ATM — that is, fonts that adhere to Adobe specifications for Type 1 fonts. TypeAlign's reliance on ATM means that its display type always looks smooth on-screen and prints at the best possible resolution on both QuickDraw and PostScript printers.

TypeAlign is a model of simplicity. You can easily create display type and get it quickly into other applications, either via the Clipboard or by saving it as a PICT, EPS, or Illustrator 1.1 file. The program has tools for drawing elliptical, straight, or irregular paths, and after you've drawn a path, the text tool is selected automatically. Once you've entered text for a path, you can edit it just as you would in a word processor as well as change the characters' size, typeface, style, color, kerning, and letterspacing. If you want to further stretch and distort type, you can select it with the pointer tool and then drag on handles that

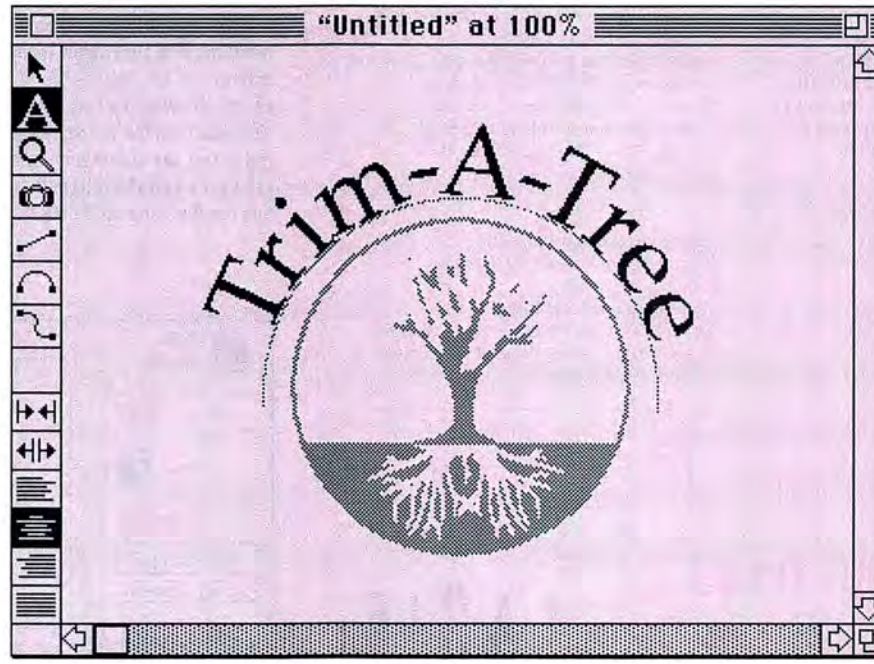


Figure 1: The TypeAlign DA lets you create simple but effective display type. Its unique camera tool takes a bit-mapped "snapshot" of whatever's underneath the DA's window. In this example, the arced text was exactly sized to match the shape of the underlying graphic before it was placed on the page.

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TypeAlign

Perspective Test

TypeStyler

Perspective Test

LetraStudio

Perspective Test

Figure 2: If you want to create display type with a true perspective effect, not all the type-manipulation programs can fill the bill. Adobe's TypeAlign (top) has the most problems. Notice how horizontal elements such as the crosspiece of the T remain parallel to the baseline, compromising the perspective effect. In Brøderbund's TypeStyler (center), horizontal elements are properly angled, but it's impossible to change the width of individual characters within a text block. Notice that the "far away" characters on the left are as wide as the "closer" characters on the right. You can create a more accurate perspective effect in Letraset's LetraStudio (bottom) by creating an envelope for the text and carefully manipulating the Bezier points.

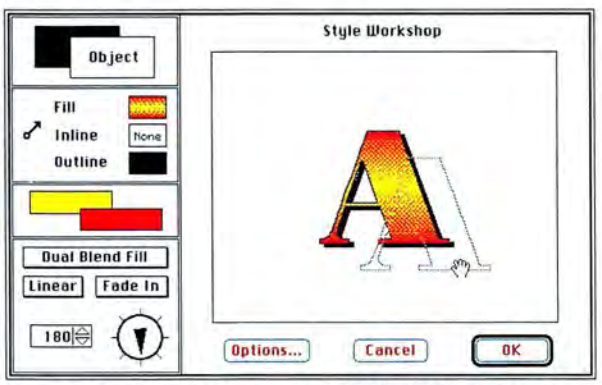
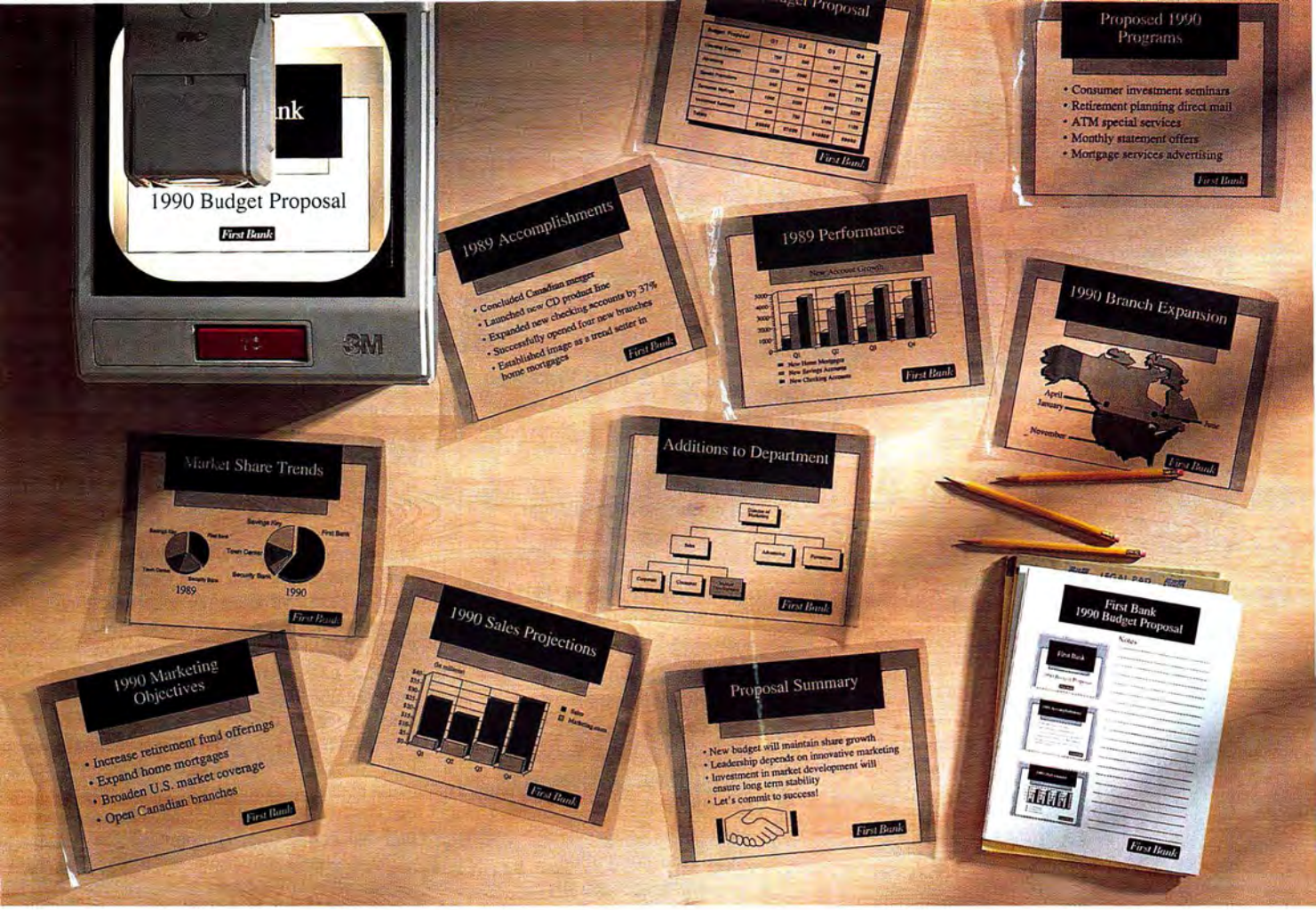
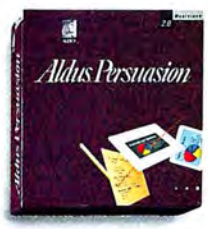


Figure 3: TypeStyler lets you apply sophisticated fill and shadow effects to display type. In this example, notice how the TypeStyler dialog box lets you position the shadow for a block of text.



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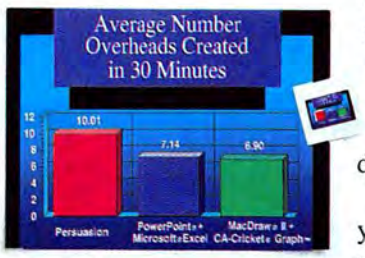


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appear around the text block.

One of TypeAlign's unique features is the camera tool, which captures a grayed-out image of whatever's directly beneath the DA's window (see Figure 1). Using this image as a template, you can create type to fit a specific shape or space.

Although TypeAlign is simple and easy to use, its type-manipulation capabilities are more limited than those of TypeStyler or LetraStudio. You can duplicate all of TypeAlign's tricks in Illustrator or FreeHand by creating blocks of text consisting of one character each and then carefully positioning, sizing, and skewing each character. If you save a TypeAlign document as an Illustrator file and then open it in Illustrator or FreeHand, you'll see that each character is saved as an individually sized and skewed font character, not as a letter-shaped outline as in TypeStyler and LetraStudio. This means that you can change any character by using the text-editing features in Illustrator and FreeHand but that you can't further distort it to create graphic effects.

TypeAlign's limitations are most apparent when you attempt to create complex effects (see Figure 2). Although you can distort the height or width of individual characters within a text block, you cannot change a character's relationship to the baseline — horizontal elements, such as the crosspiece on a *t*, will always remain parallel to the baseline. This can make certain tricks, such as perspective effects, difficult to achieve. However, TypeAlign does have one feature that the other two programs — for all their sophistication — can't match. Its freehand path tool lets you draw a convoluted curve with multiple control points; the others are limited to single or double arcs.

If you use many Adobe fonts and you've already purchased ATM, TypeAlign is a logical and inexpensive way to get the most out of your Type 1 fonts. However, if you frequently need to create display type involving more elaborate distortions and dramatic graphic effects, TypeStyler or LetraStudio may be the program for you.

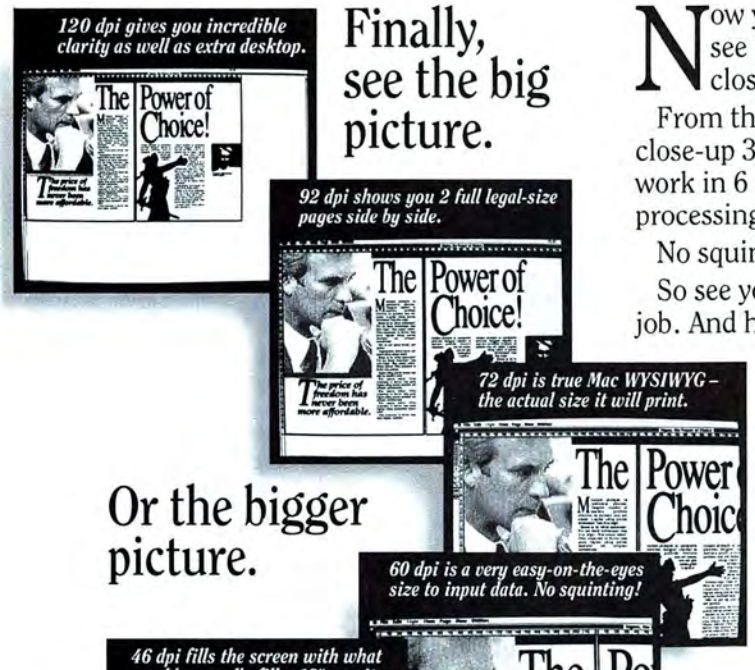
TypeStyler 1.02

In contrast to TypeAlign, which is a simple DA, Brøderbund's TypeStyler ($199.95) is a full-blown, powerful application (see "Focus: TypeStyler," September '90, page 259, and review, May '90, page 110). TypeStyler can convert most PostScript fonts, including Adobe



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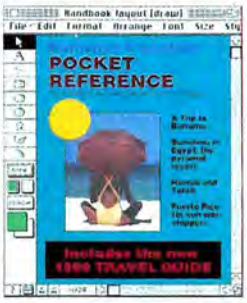
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Type 1 fonts, into its own SmoothFont format, after which you can manipulate type with more sophistication than is possible with TypeAlign.

With TypeStyler, you first enter your text in a dialog box and then modify the text with the program's powerful distortion and styling tools (see Figure 3). You can enter and modify multiple lines of text simultaneously. TypeStyler has a full selection of kerning, letterspacing, and leading controls. In addition to letting you manipulate type, the program allows you to create a variety of geometric shapes that you can use as graphic elements along with type.

TypeStyler offers several predefined shapes, including circles, assorted single and double arches, and perspective effects. In addition, it has a style library that contains 35 fill, outline, 3-D, and shadow effects, which you can customize. The program lets you specify extremely complicated effects, such as multiple graduated fills and zooming shadows.

Where TypeAlign lets you distort text by dragging on simple handles, TypeStyler uses Bezier control points and a single anchor point at each corner to give you more complete control over the shape of your type. Not only can you distort a text block by dragging on the anchor points, but you can also curve the top and bottom by repositioning the control points. When reshaping a text block, TypeStyler does a much better job of fitting the type to the shape than can TypeAlign, with its limited skewing capabilities (see Figure 2). Unlike TypeAlign, TypeStyler aligns characters' horizontal elements in correct proportion to the object's top or bottom rather than the baseline.

One of TypeStyler's few faults is that you can't change the size, style, typeface, or any other aspect of an individual character within a block of text. Any such formatting change can be applied only to the block as a whole. To make individual characters' width proportional to their height, for example, you have to create each character as a separate text block and then link the blocks. Another TypeStyler shortcoming is that it reacts awkwardly if you reword text so that the number of characters increases or decreases. The text block's size doesn't change to accommodate the new text; the characters are simply stretched or squashed to fit the object's current size and shape. TypeStyler 1.5, which recently

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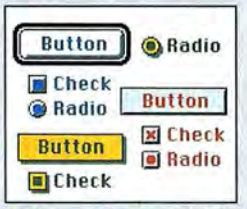
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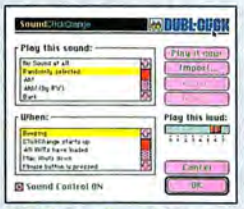
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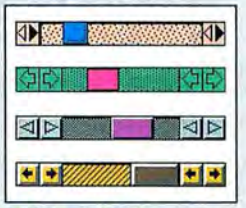
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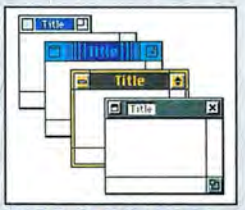
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Figure 4: TypeStyler does an excellent job of converting the outlines of its distorted type into Adobe Illustrator outlines. Notice the economical number of Bezier points on each character. LetraStudio creates an excessive number of points on each path, so that making even the smallest change requires you to carefully move dozens of points.

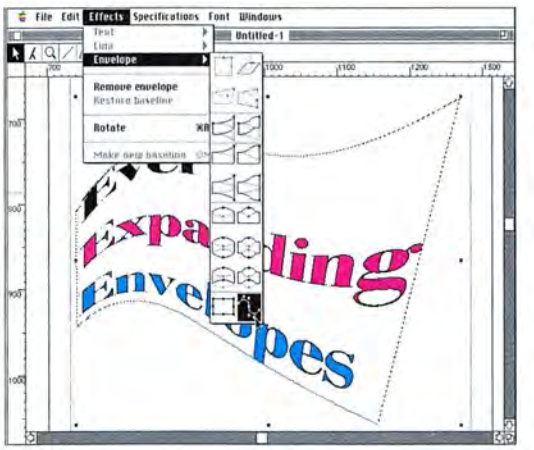


Figure 5: LetraStudio's envelopes let you create sophisticated typographic distortions. The Envelope submenu (top) contains predefined envelopes that you can customize by manipulating Bezier anchor and control points. Holding down the Option key lets you drag individual objects within an envelope (bottom). The distortion of any object you move is then based on its new location within the envelope, as the word *Ever* illustrates in this example.



became available, addresses most of these shortcomings.

The program prints to PostScript and non-PostScript printers, and it produces excellent color output. Its outline, fill, and shadow effects are impressive, but if you go overboard, you can easily create files that take hours to print from your LaserWriter — if they print at all.

TypeStyler lets you save art to the Clipboard or as EPS, PICT, or Illustrator files (saving in any of these file formats

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retains only the outlines of characters or panels, not the style effects). When exporting to Illustrator format, TypeStyler creates actual outlines for each character and uses only the minimum number of control points necessary to accurately create each letter's shape. Because TypeStyler is so economical with the number of points it uses to define a character's path, its outlines make an excellent starting point for work in Illustrator or FreeHand (see Figure 4).

If you're looking for a powerful all-in-one program, TypeStyler is a good bet. Its style library, with its fill and shadowing features, make it easy to create impressive-looking display type and logos in a hurry. Its manipulation capabilities are good, but they're not as sophisticated as LetraStudio's. If you need the utmost in typographical precision, Letraset's LetraStudio may be the program for you.

LetraStudio 1.5

LetraStudio ($495) was the first Mac program that let you interactively reshape type (see review, May '89, page 183). It's still the most powerful and most expensive type-manipulation program available. When LetraStudio was first released, it worked only with LetraFonts, LetraStudio's special set of graphic fonts. These fonts had limited usefulness, and even worse, they employed an awkward copy-protection scheme. Copy protection is long gone, and now LetraStudio, like TypeStyler, supports Type 1 fonts. When you launch LetraStudio, it automatically scans your System Folder for printer fonts and adds them to its menu of available fonts.

The program lets you place text on an elliptical path or on a straight line, which can then be extensively modified. As with TypeAlign, you can simply type and edit your text without using any intervening dialog boxes, and as with TypeStyler, you can add geometric graphic shapes to your artwork.

LetraStudio has a powerful Effects menu, from which you can choose several predefined baseline effects, such as single and double arches. You can also modify your text block's baseline by moving each individual Bezier control and anchor point. As with TypeStyler, there's an anchor point at each end of the baseline as well as in the middle. This extra point can be used to create a curvier, more precise baseline than is possible in TypeStyler. LetraStudio gives you greater options

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Newtext BOOK ITALIC
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than do the other programs for formatting individual characters within a text block. You can change the font, size, vertical spacing, color, and other properties of any character whenever you want.

What really sets LetraStudio apart from the competition, however, is a concept called envelopes. Envelopes are predefined shapes that can contain one or more text or graphic objects. By modifying an envelope's shape, you determine how LetraStudio distorts the shape of objects within it (see Figure 5). There are several predefined effects you can apply to an envelope. The most interesting effects can be achieved by directly modifying the shape of an envelope, using Bezier control and anchor points located at each corner and at the midpoints of the top and bottom sides of the envelope. The Bezier points don't simply affect the shape of the envelope — they also affect how objects within the envelope are distorted. Move the control points closer to the anchor point, and the objects within the envelope will shrink as they approach the anchor point. Stretch the handles, and the objects will similarly stretch. Like using Bezier points to define a path, envelopes are more complicated to explain than to learn.

LetraStudio has kerning, letterspacing, and leading controls, and you can specify colors and shades for outlines and fills, although without all the elaborate options available in TypeStyler. On a color or gray-scale monitor, LetraStudio uses anti-aliasing to reduce on-screen jaggies in text, and you can copy this anti-aliased type to the Clipboard to paste into any application that supports color PICT.

The program saves files as PICT, EPS, or Illustrator files as well as in a file format that can be read and edited by FontStudio, Letraset's font-editing program. If you want to edit a character's outline, it may be better to do it in FontStudio, rather than in Illustrator or FreeHand. LetraStudio outlines have a considerable number of points closely distributed along every path, so even the simplest reshaping of a character created by LetraStudio requires moving scores of points (see Figure 4).

Although LetraStudio is in many ways the most powerful of these three type-manipulation programs, it's not without shortcomings. When you launch it, it automatically scans every Type 1 outline font in your System Folder. Unfortunately, if you have too many fonts in the folder, LetraStudio will run out of memory and refuse to load, even if you've devoted several megabytes of memory to the program. Therefore, if you're a heavy-duty user of Type 1 fonts, you'll need to move the outline fonts you don't want to use out of the System Folder.

LetraStudio can't match TypeStyler's built-in 3-D and shadowing effects, but whether this is a drawback or not really depends on how you're using the program. If you're an artist looking for the ultimate in type manipulation, such effects probably aren't as important as the sheer power LetraStudio gives you for controlling type. Its envelopes, with their multiple Bezier points, provide the most-sophisticated effects of all the programs, making LetraStudio the obvious choice for anyone interested in high-end design. Now that LetraStudio can make use of Type 1 PostScript fonts, it's becoming an indispensable tool for serious designers.

High Road or Low?

There is no real winner or loser among these programs — each may be just the thing you need to solve a specific problem. If your type-twisting needs are light, TypeAlign offers ATM users an economical and easy-to-use solution that can produce professional-looking results quickly. If you need a more sophisticated program, TypeStyler gives you a full repertoire of easily applied graphic effects. LetraStudio provides the fullest and richest tools for type manipulation — with a price to match.

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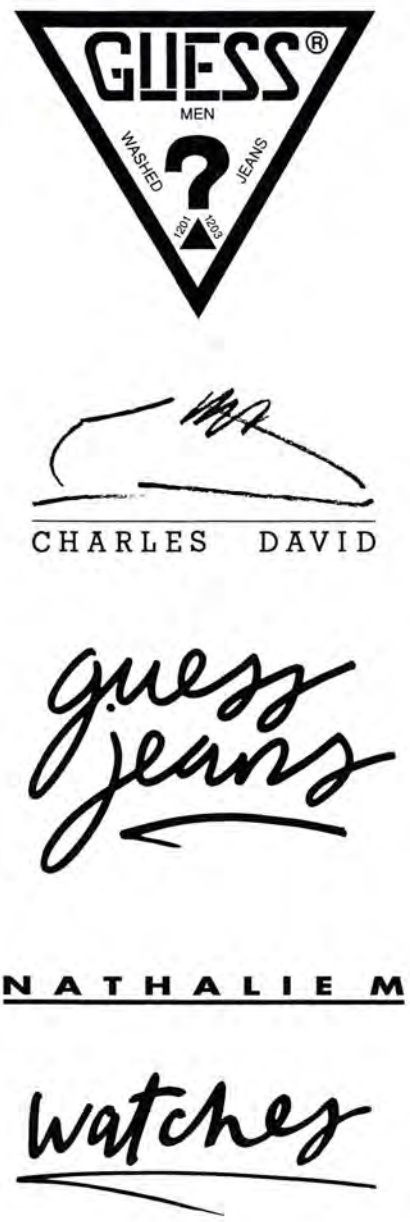
By the editors of *Verbum* magazine

Guess? Inc. uses the Mac to create promotional pieces for its various clothing and product lines. Until recently, all the company's product logos were conventional artwork that had to be stripped into layouts. Guess? wanted to create electronic versions of the logos that could be easily inserted into Mac-produced publications ranging from advertisements to letters and invitations, eliminating the need for mechanical pasteup.

At Guess?'s behest, Doug Isaacs of DeskPrint, a Los Angeles service bureau, converted 18 logos into a PostScript font called GuessType. Each logo was scanned; edited; and then turned into a font character with Altsys' Art Importer, a program with the unique ability to create Type 3 PostScript fonts from EPS and PICT images. Collecting the logos into a PostScript font offers several advantages: All the logos are just a keystroke away, resizing means simply changing the point size, they can be imported into programs such as word processors that don't accept EPS graphics, and they always print with high-resolution PostScript quality.

***Verbum: The Journal of Personal Computer Aesthetics* can be reached at Box 15439, San Diego, CA 92115; (619) 233-9977.**

1. Electronic Logos



All of Guess?'s product logos were converted from conventional artwork to a PostScript font, making it easier to use them in promotional materials produced on the Mac. Five characters from the GuessType font are shown here.



2. Scanning the Artwork



Black-and-white stats of the logos are enlarged and scanned as a 600-dpi TIFF image to ensure that all details of the handwritten script logos are faithfully captured. The logos are scanned vertically to take advantage of the maximum image length of the scanner.

3. Auto-Tracing the Logos



Each TIFF image is auto-traced in Streamline and saved as an Illustrator 1.1 file. The high-resolution scans produce accurate PostScript auto-tracings that require little touch-up, and Streamline automatically fills the traced areas with black to match the original image.

4. Editing the Images



Each logo is rotated 90 degrees, and the baseline is shifted a few degrees until it looks right. The finished logo is now ready for Art Importer to convert into a font character.

5. Converting Type to Graphics



Some logos use typefaces that resemble Adobe fonts. For example, the Charles David logotype is similar to Adobe's Memphis font. Editable font outlines are created from the appropriate fonts with Metamorphosis or TypeStyler.

6. Adjusting the Outlines



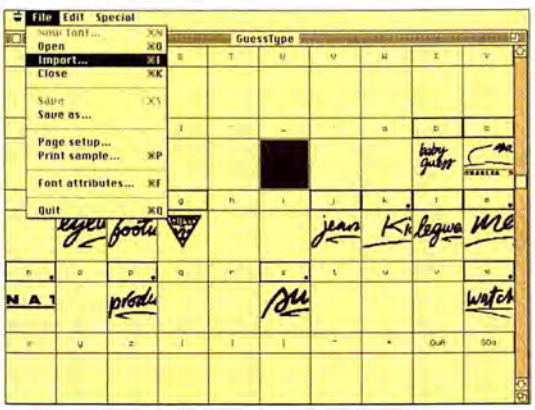
Converting the fonts into graphic objects eliminates the need to have the Adobe printer fonts installed, and it lets the designer correct typeface discrepancies between the Adobe fonts and the Guess? logos. Using the original Charles David scan as a template (top), he adjusts the leg of the R in the Memphis outline (center) and then fills the corrected R with black (bottom). The edited type is combined with a horizontal rule and an auto-traced drawing of a shoe to produce the finished logo.

7. Recreating the Guess? Logo



The triangular Guess? logo is constructed entirely in FreeHand, with the scanned images serving as templates. The unique type for Guess? is hand-traced with FreeHand's corner and curve tools. For the other type, font outlines are created from Helvetica and Helvetica Bold.

8. Creating the PostScript Font



The finished electronic logos are saved as EPS files and converted into a PostScript font with Art Importer. The process is simple: You select the key, choose Import from the File menu, and select the desired EPS file, and the image is imported and assigned to the key. When the completed font is saved, Art Importer automatically creates Type 3 screen and printer fonts. To avoid a jagged appearance on-screen, the designer creates the screen fonts in several point sizes. (Type 3 fonts are not compatible with Adobe Type Manager.)

9. Using GuessType


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GuessType can be installed and used just like any other electronic typeface. For instance, if you select GuessType from the Font menu and press the C key, the Charles David character will appear. The logos can be used at any point size, and because GuessType is a PostScript font, they print cleanly. The Charles David and Nathalie M characters were used in this invitation for the Guess? Spring 1991 footwear show.

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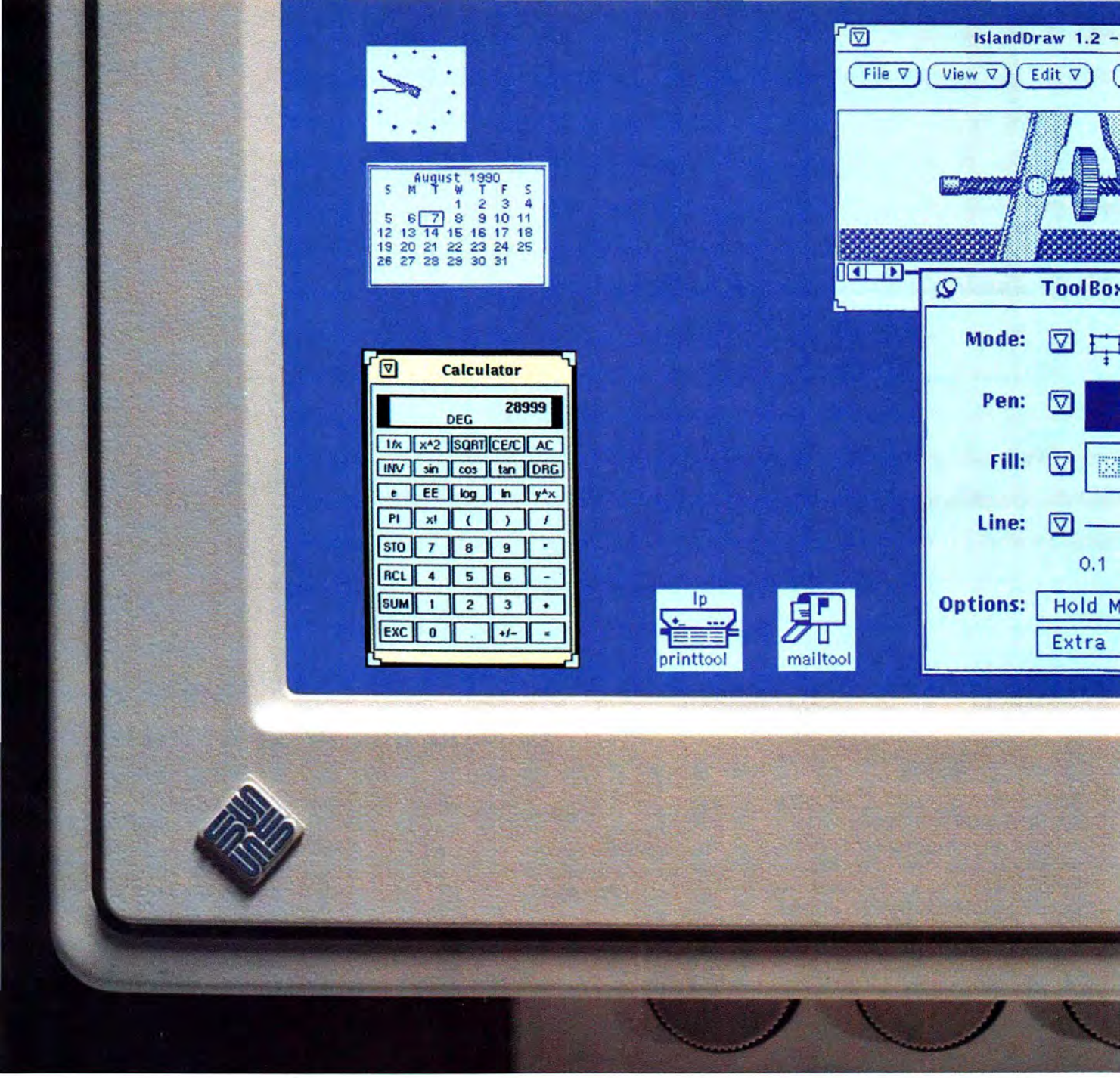
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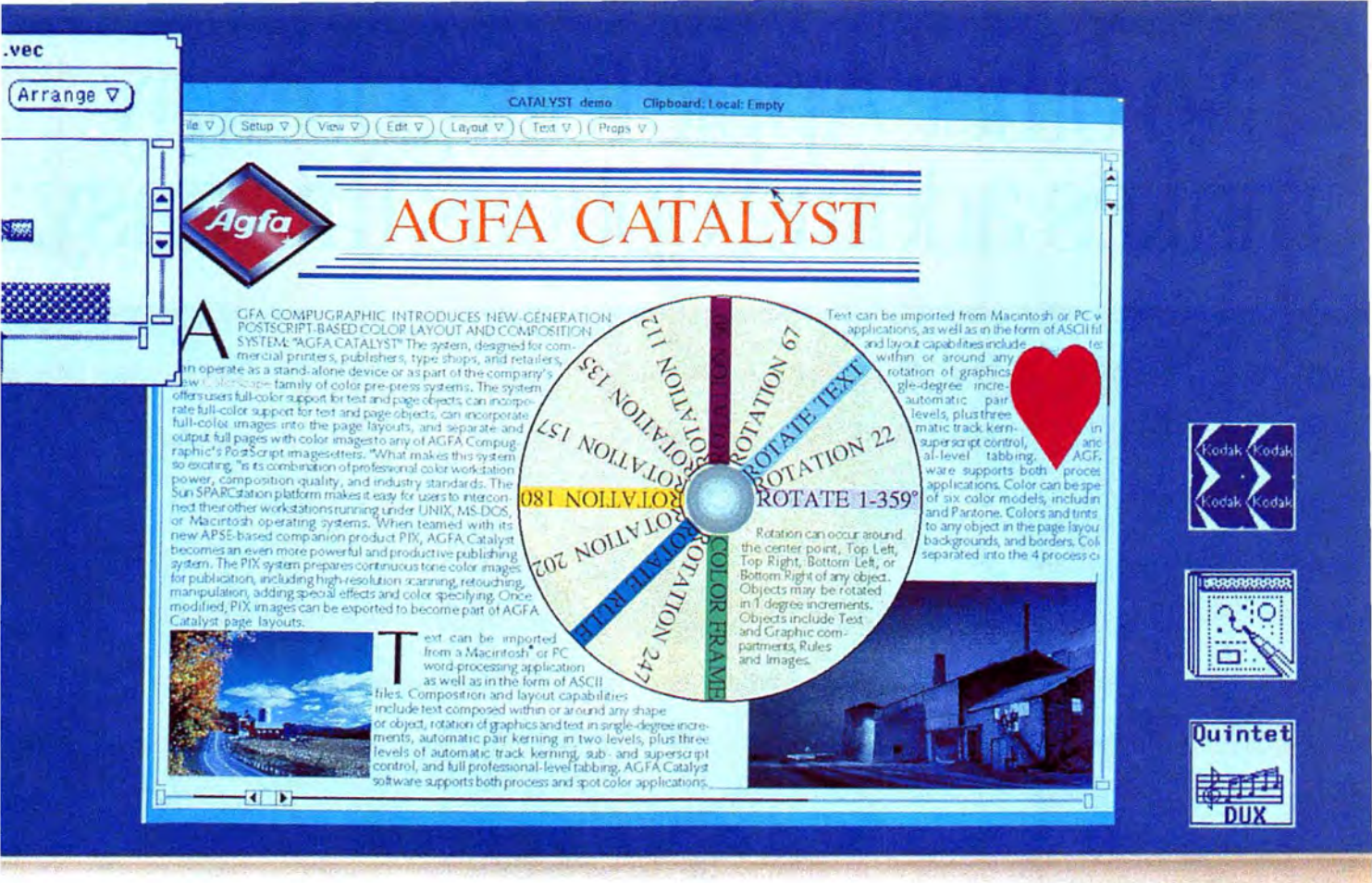
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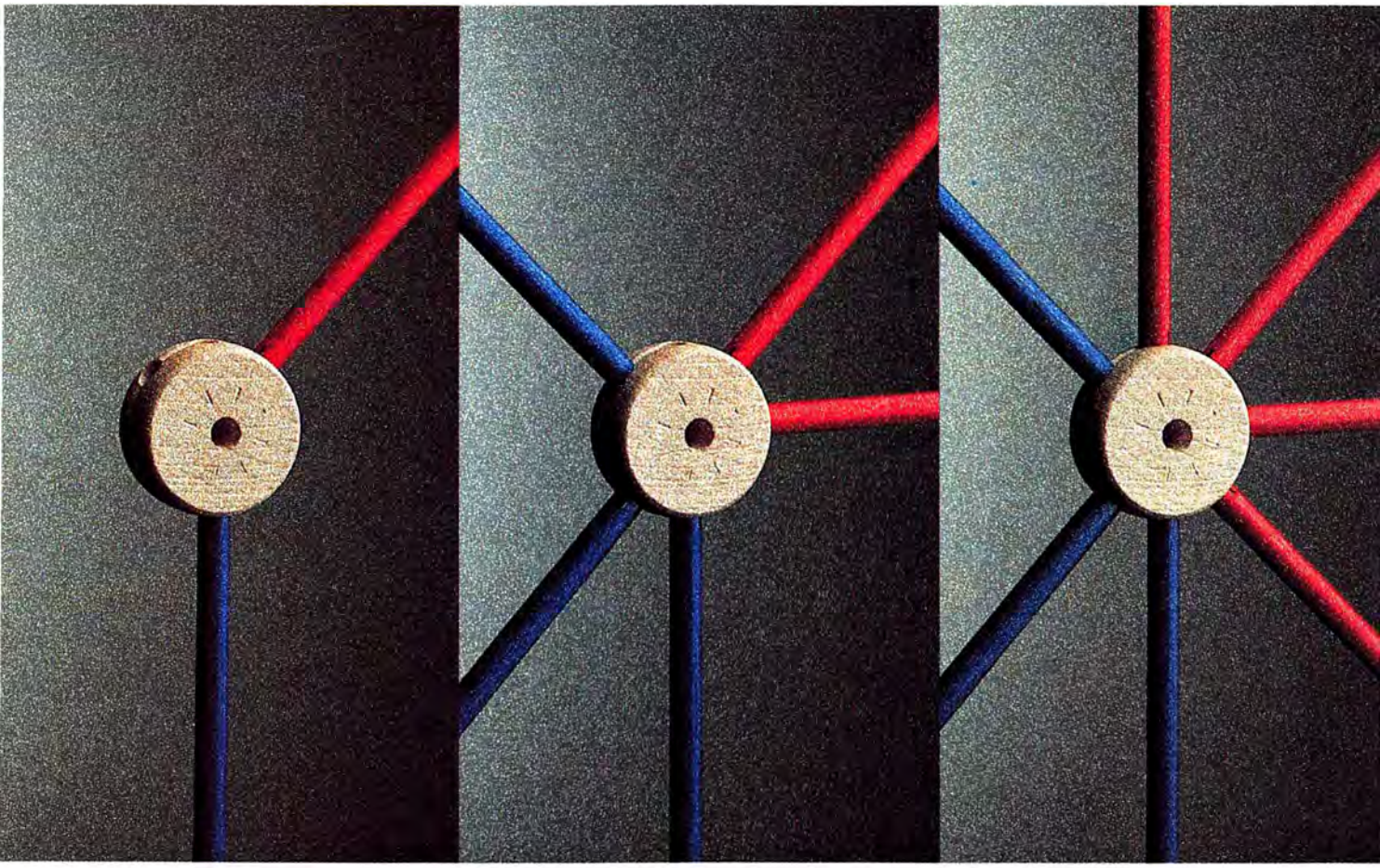
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NeXT is back — big time — with four new 25-megahertz 68040-based machines. The standard cube: slashed to $7,995. The NeXTdimension 32-bit-color board ($3,995) — with graphics acceleration, hardware compression, video input and output — gives you a dynamite color system. For the budget-minded: NeXTstation, a 2-bit gray-scale CPU in a pizza box ($4,995). Low-cost, 16-bit color: NeXTstation Color ($7,995). Plus — radical idea — they all have a floppy-disk drive. And just wait till you see Lotus' new NeXT-based spreadsheet program, Improv!

By Henry Bortman

Finally there is some software that actually uses networks the way networks are meant to be used: for collaborative computing. My favorite is Aspects from Group Technologies. As I see it, this is the first true groupware product. It works this way: You, Nora, Daniel, Maia, and I are connected on an AppleTalk network. We all open the same Aspects document at the same time. It can be a text, paint, or draw document. We all make changes to the document — at the same time. All of our screens update in the blink of an eye to reflect all the changes. $299 per node. Shipping by the time you read this.



Also hot: DataClub from International Business Software. DataClub lets several users on a network share data that resides on their local hard disks. Not news, you say? Here's the twist: All the users see the data, regardless of whose hard disk it resides on, as part of a single AppleShare-type server. Even if you move the data from one machine to another, it still appears in the same folder on the server. $295 for three users; $795 for ten. Should be shipping by the time you read this.

They said it couldn't be done, but Oracle is planning to implement its SQL relational-database server on the Mac. This is the real deal, not a development kit. Of course, you'll want a IIfx with 8 megabytes of RAM to run it, and Oracle hasn't said what it's going to charge for it. Look for a ship date in early 1991.



How about this? DirectServe, the Jasmine product that won a MacUser Eddy and promptly stopped shipping, has competition. ShirtPocket Software now also sells an AppleShare-server-in-a-box. EasyServer, unlike DirectServe, can read from and write to any standard Mac HFS-formatted hard-disk drive or other storage device. Began shipping in October. $1,995.

OK, I admit it. There probably won't be a whole lot of people who care. But here's some more NeXT news: Although the new NeXT machines have floppy-disk drives, for those of you who need one for your old cube, Pacific Microsystems' PM1.44 Floppy Disk Drive for the NeXT can now read and write Macintosh FDHD (1.4-megabyte) floppies. Sorry, it still doesn't support 800K floppy disks. The price has dropped from $995 to $849, which makes the PM1.44 a much better buy than it was when we reviewed it in October '90 (page 222).



Sharing Your Mac

Ever wish you could show someone how to do something on a Mac — without leaving your office? Now you can, with Timbuktu, Timbuktu/Remote, and Carbon Copy Mac.

By Henry Bortman and the MacUser Labs staff

Your friend calls you on the phone. "I can't print," he says. Half an hour later, you've figured out why — the LaserWriter driver in his System Folder has somehow gotten corrupted — and you've guided him through the necessary reinstallation procedure. This is all done over the phone, of course. All the while, you kept wondering what he *wasn't* telling you — which was precisely what you needed to know.

Headache factor: two to three Excedrin.What if you could dial his computer instead, see *his* screen in a window on *your* screen, and control his Mac with your mouse? Science fiction? Nope. The software products Timbuktu and Timbuktu/Remote (from Farallon) and Carbon Copy Mac (from Microcom) let you share — and control — other Mac users' screens.

Although screen-sharing programs are sometimes billed as the ultimate in collaborative computing — the hype says they enable multiple users to work on the same document at the same time — this is neither a particularly practical nor a particularly common use for them. Until the day when word-processing, drawing, layout, and other applications are designed specifically for multiuser access, collaborative computing will remain an enticing fantasy.

A more typical use of screen-sharing programs is for technical support, as in the example above. Training classes are another good use for these programs. Let's say you're teaching a class on how to use FileMaker. All the students have a Macintosh at their desk, and they're all connected on a network. You want everyone to see what's on your monitor. You can project it on a big screen at the front of the class and hope that the people in the back can see it. Or you can install screen-sharing software and let everyone observe your actions directly on their own screen. Network managers also find these programs useful. When a server has a problem, screen-sharing software running on an AppleShare server can save you a lot of walking, driving, or even flying time.

Timbuktu ($145) was the first screen-sharing product on the market; version 1.0 shipped in December 1987. It could be used only over AppleTalk LANs (local-area networks). A year later Timbuktu/Remote ($195) shipped,



Figure 1: Carbon Copy Mac lets users share Mac screens over either AppleTalk or modem (serial) connections. But it does not allow a user to both control and be controlled by another user simultaneously.



Figure 2: Timbuktu (2a) works over AppleTalk connections. Timbuktu/Remote (2b) works over modem connections. Both products allow a Mac to be controlled by another user and to control another user simultaneously, however. Here, Moe's Mac is being controlled by Curley's over the network and will control Harriet's via modem.

providing screen-sharing capability over modem and direct serial links. Both products have been upgraded since their introduction. Microcom — which has had a similar product, Carbon Copy Plus, for PCs since 1984 — threw its hat into the ring with Carbon Copy Mac ($199 for one user; $299 for two) in April 1990. Now that the product category has matured, MacUser Labs decided to set the programs up in the NetWorkShop to see how well they do their job.

The Basics

These three products allow one user to observe and/or control another user's Mac. They all display the host screen in a resizable window on the guest screen. (In screen-sharing parlance, the *host* is the computer whose screen is being observed or controlled; the *guest* is the computer observing or controlling the host.) When used on a network, these products let multiple guests simultaneously observe or control the same host machine. All three programs also provide Mac-to-Mac file-transfer capability. And they all offer a measure of security by allowing a host to restrict guest access.

There are some significant differences, however. The most obvious one is that Carbon Copy Mac integrates AppleTalk and modem connections in the same product (see Figure 1). Farallon gives you only AppleTalk connections with Timbuktu and only modem connections with Timbuktu/Remote, so Carbon Copy Mac is a less expensive option for those who want both types of connections.

Timbuktu and Timbuktu/Remote, however, allow a Mac to be both a guest and a host simultaneously (see Figure 2). Carbon Copy Mac doesn't. Suppose we're both in an office on the East Coast. We want to observe a demo of some software being developed by an engineer on the West Coast. You and I are on the same network but in different buildings. I can connect via Timbuktu/Remote to the engineer, you can connect via Timbuktu to me, and we can both watch the demo. Only one phone call is necessary, and my Mac is a host and a guest at the same time. (We had some trouble with this feature with version 3.1 of Timbuktu; version 3.1.2, which arrived just as we went to press, seemed to have had the bug fixed.) With Carbon Copy Mac, you have to alternate between being host and guest.

Timbuktu has yet another significant advantage: It lets a guest connect to multiple hosts simultaneously (see Figure 3). Each host screen appears in a separate window. The only limit on the number of possible hosts is your computer's available memory — each screen requires about 50K of RAM. Carbon Copy Mac, even when run over AppleTalk, allows only one connection.

Another difference is how the programs handle the problem of a host screen that doesn't fit entirely inside the window on the guest screen. Timbuktu and Timbuktu/Remote use scroll bars (see Figure 3) that let a guest navigate around the host screen. Carbon Copy Mac has no scroll bars (see Figure 4); instead it uses automatic panning, which means that when you move your cursor off the edge of the host window, the contents of the window move by.

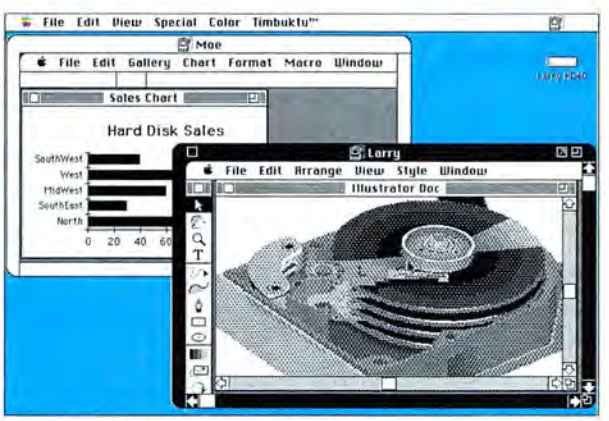


Figure 3: A Timbuktu guest (the observing or controlling Mac) can connect to more than one host (the observed or controlled Mac) at a time and can use scroll bars when the host screen won't fit entirely in the guest Mac's window.

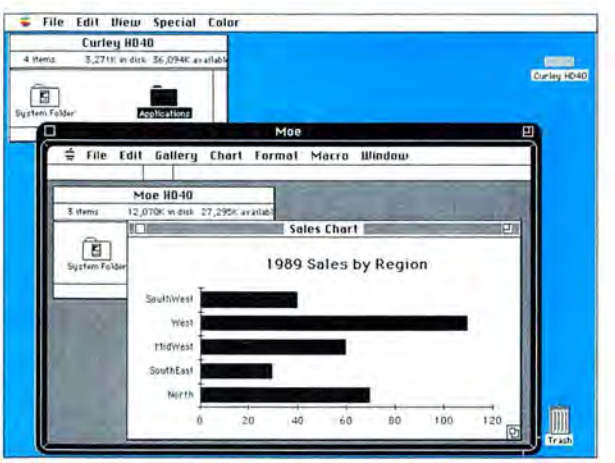
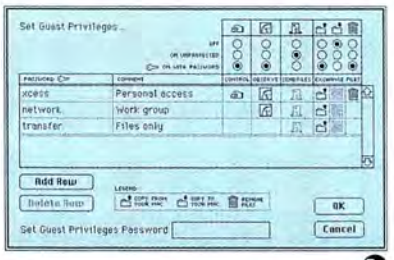


Figure 4: Carbon Copy Mac can connect to only one host at a time. It uses automatic panning to scroll through a host screen that won't fit completely in its window on the guest Mac.



5a



5b

Figure 5: Timbuktu and Timbuktu/Remote (5a) and Carbon Copy Mac (5b) all allow a host user to restrict guest users' access to the host Mac. Timbuktu and Timbuktu/Remote offer more-flexible file-sharing restrictions, but the dialog box for setting them is confusing. Carbon Copy Mac's Options dialog box is easier to use, but it offers fewer options for controlling file transfers.

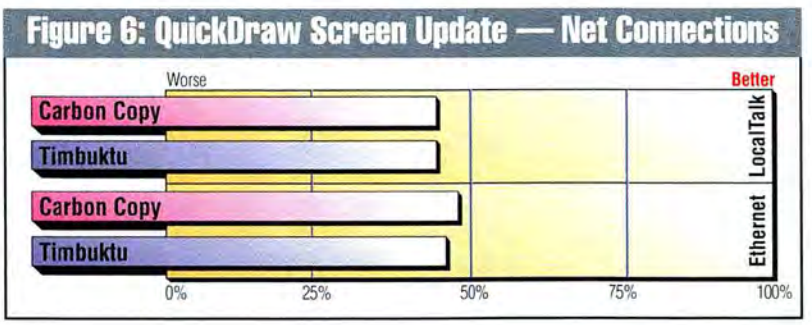


Figure 6: For QuickDraw screen updates — menus, dialog boxes, scroll bars, and the like — Timbuktu and Carbon Copy Mac are equally fast over network connections. Higher numbers indicate better performance — 100 percent represents the performance of a IIcx whose screen isn't being shared.

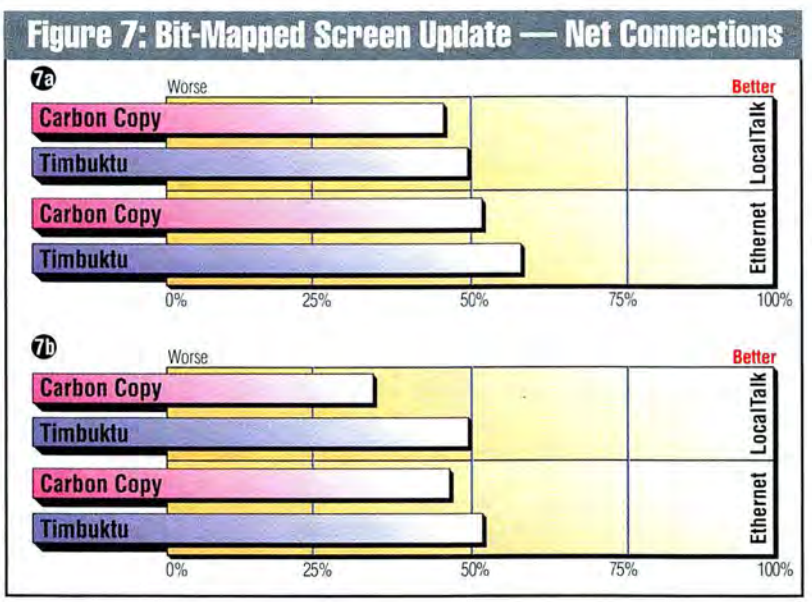


Figure 7: Timbuktu is slightly faster than Carbon Copy Mac when one guest is logged on to a host (7a). It picks up more of a lead when running over LocalTalk when several guests are logged on to the same host (7b), but it evens out again with four guests when running over Ethernet. Higher numbers indicate better performance — 100 percent represents the performance of a IIcx whose screen isn't being shared.

Installation

All three programs are easy to install. Each includes an INIT, a DA, and some additional files required by the system. Timbuktu and Timbuktu/Remote use Apple's Installer program; Carbon Copy Mac requires you to use the Finder and Font/DA Mover. With Timbuktu and Timbuktu/Remote, however, if you don't want to install the DA directly into your System file and prefer to use Suitcase or Font/DA Juggler, you have to use the Finder anyway. You also have to use it if you install Timbuktu on a Mac IIfx or on the new IIsi or LC. The Timbuktu installer disk contains System 6.0.4, but the IIfx requires 6.0.5 and the IIsi and LC require 6.0.6.

For the Privileged

Before you can be a guest on someone else's Mac, its user must first grant you access. For screen sharing, all three programs offer the same two guest-access privileges: view (or observe) and control. If you have viewing access, you can only watch another person's screen. If you have controlling access, you can control the host machine with your mouse. Carbon Copy Mac offers one access feature that Farallon's products lack: The host receives a notice when a guest is trying to log on, which allows the host to refuse access.

When it comes to file-sharing options (see Figure 5), all the programs allow a

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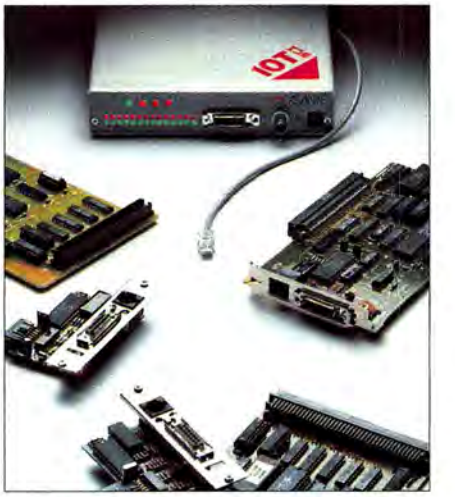
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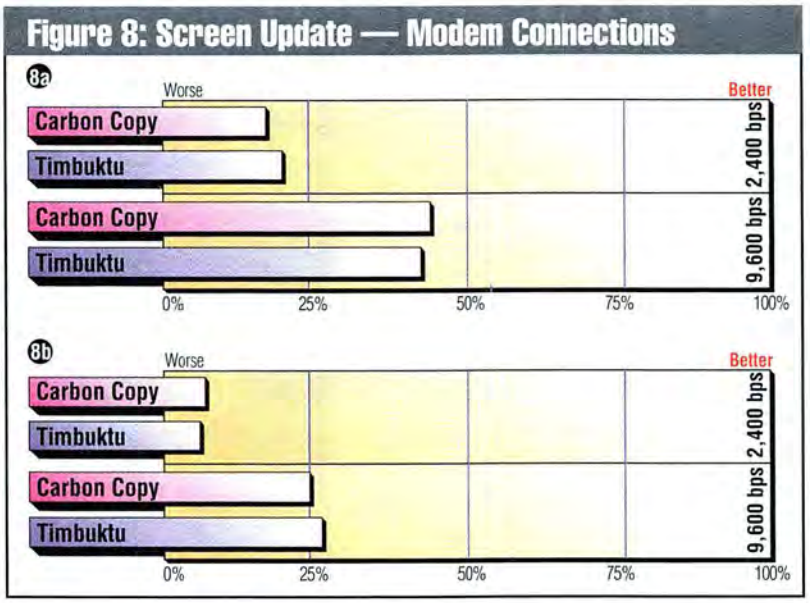


Figure 8: Screen-update performance is a toss-up between Timbuktu/Remote and Carbon Copy Mac over modem connections. Not surprisingly, 2,400-bps performance is unacceptably slow, although QuickDraw screen updates (8a) are somewhat faster than bit-map updates (8b). Higher numbers indicate better performance — 100 percent represents the performance of a IIcx whose screen isn't being shared.

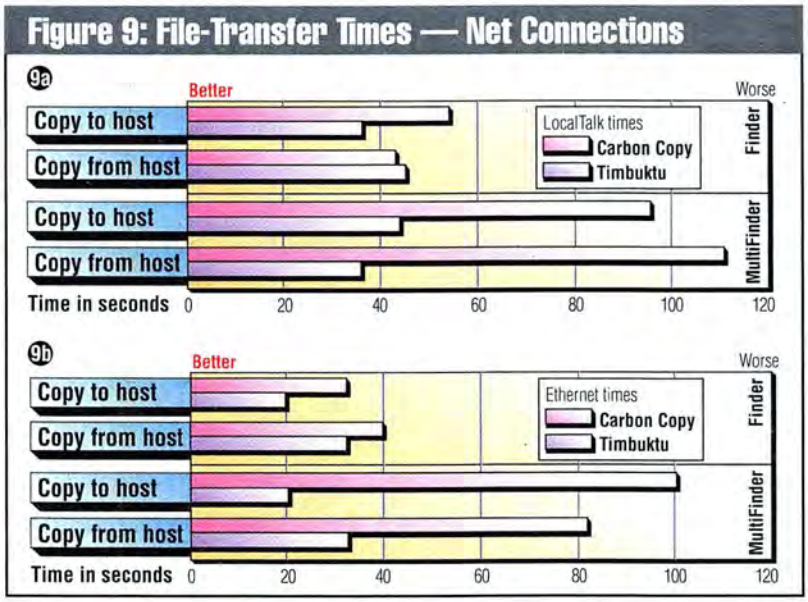


Figure 9: Timbuktu offers slightly faster file-transfer performance than does Carbon Copy Mac under the Finder and significantly faster performance when running under MultiFinder. However, Carbon Copy Mac has better background performance, so users who initiate a file transfer regain control of their Mac rather than having to wait for the transfer to finish first. Times shown represent the time, in seconds, it took each program to transfer a 275K file.

host to grant a guest the privilege to get files (from host to guest) or to send files (from guest to host). To these two options, the Timbuktu twins add two more privileges. The first is to remove files, which lets a guest delete files from a host disk volume. The second is to send files from a guest to a host without revealing the host computer's file-directory structure to the guest. You can set up a drop box in a specific location on the host's disk drive or let Timbuktu or Timbuktu/Remote do it automatically.

In the area of security, Timbuktu and Timbuktu/Remote offer more security options than does Carbon Copy Mac. The Timbuktus allow a host to create different "classes" of users, each with a different set of privileges and a different password (see Figure 5a). Carbon Copy Mac allows the host to set only a single password for all guests (see Figure 5b). Timbuktu/Remote and Carbon Copy Mac display all passwords as a series of bullets; Timbuktu, unfortunately, displays the full text of passwords in plain view to anyone who opens the Guest Privileges dialog box.

Although Timbuktu and Timbuktu/Remote's controls are more extensive, their Set Guest Privileges dialog box is a nightmare. It tries to cram too many different types of information into too small a space, and although its icons are reasonably intuitive, the clutter of the dialog box can overwhelm users. This is Timbuktu's biggest shortcoming. To its credit, Timbuktu/Remote offers the additional security of modem dial-back —

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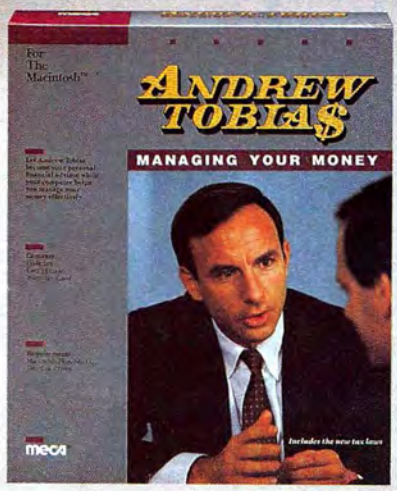
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you call a remote modem, but it has to call you back before you can make a connection — a feature that Carbon Copy Mac lacks.

Reach Out and Draw

When the image on a host screen changes, screen-sharing programs use two different methods — bit maps and QuickDraw commands — to tell a guest machine to update its screen. Say your Mac is the guest and mine is the host. When you make the initial connection to my Mac, my Mac sends a complete bit-mapped image of its screen to your Mac. Each pixel is represented by one bit of data. After that, some changes on your screen result in another bit map being sent over the connection and others result in QuickDraw commands. Typically, bit maps require more data than do QuickDraw commands to describe a screen change, although data compression can reduce the amount of data needed.

MacUser Labs devised tests that looked at both QuickDraw and bit-map-update performance. The QuickDraw test is an indicator of what kind of response you can expect from the Mac's user interface — menus being pulled down, dialog boxes being opened, file lists being displayed in the Finder. All these actions use QuickDraw to do their work. Timbuktu and Carbon Copy Mac perform at virtually identical speed for network connections, updating a shared screen at about half the rate of an unshared screen (see Figure 6). Similarly, Timbuktu/Remote and Carbon Copy Mac handle QuickDraw updates with nearly identical speed over modem connections. Of course, modem connections are slower than network connections.

When pulling down menus, opening dialog boxes, and the like, Timbuktu and Carbon Copy Mac perform at virtually identical speed.

Pixel This

To test bit-map updates, we timed the redrawing of an 8-bit-color photograph in Photoshop. This test involved sending a bit-mapped-screen update across the connection between host and guest. Although the QuickDraw test is a good indicator of general interface responsiveness, the bit-map test indicates responsiveness of images drawn inside an application's windows. And although it may seem that this would apply only to painting programs, which produce bit-mapped images, many drawing programs — and even some word processors — update the screen with bit maps rather than by using the text-drawing routines built in to QuickDraw. (Some notes of caution: All three programs work only in black-and-white, and none does a great job of displaying an 8-bit-color or gray-scale host image. Illustrator previews are particularly pesky. You may want to set a host to 1-bit mode while its screen is being shared.)

When a host sends a bit map to a guest, the type of compression used can be

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significant. Proper compression reduces the amount of data required to send a bit-map update over the connection. Both Farallon and Microcom build proprietary compression schemes into their screen-sharing products. In Timbuktu and Timbuktu/Remote, compression is always on; Carbon Copy Mac makes it optional. Unfortunately, the latter's manual does a poor job of telling you when to turn it on and when to leave it off. The only time you really want it on is when you're using a 2,400-bps-modem connection. Performance actually degrades by up to 50 percent when compression is used over a network. We left it on for the modem tests and turned it off for the network tests.

Bit-map updates over network connections show that Timbuktu has a slight edge over Carbon Copy Mac (see Figure 7a). When four guests were logged on to the same host simultaneously, Timbuktu's lead increased (see Figure 7b). This is because Timbuktu sends bit-map-update data over the network only one time, addressing it to all guests at once; Carbon Copy Mac sends a separate bit- map-data message to each guest, which takes longer.

We were intrigued to see that when using screen-sharing programs, Ethernet doesn't offer much of a performance boost over LocalTalk. Even with bit-map updates, the amount of data being transmitted from host to guest is not enough to overwhelm a LocalTalk network, so Ethernet doesn't offer much help. Of course, we did our tests on networks that had no other traffic on them. If you add Timbuktu or Carbon Copy Mac to an already busy LocalTalk network, everything may slow down unacceptably and Ethernet could help in such situations. (See "The Limits of LocalTalk," September '90, page 299, for more information about the impact of combining screen sharing with printing, mail, and file serving on a LocalTalk network.)

At 9,600 bps, Timbuktu/Remote performed only slightly better than Carbon Copy Mac did on our bit-map-update test. At 2,400 bps, the two programs performed nearly identically — they were both slow! Farallon and Microcom don't recommend 2,400-bps operation with their programs, and our test results show you why (see Figure 8). If you plan to share screens over modems, figure on buying 9,600-bps modems — or on being very frustrated.

File-Transfer-Test Results

For those looking for an easy way to transfer files from one Macintosh to another without investing in a dedicated file server, all three of these screen-sharing products offer a reasonable solution. We don't recommend buying them primarily for this purpose: There are other, less expensive programs that have higher performance (see "The End of SneakerNet?" September '90, page 281). It's a great "bonus" function, however, and one that fits naturally with screen sharing. Figure 9 shows the time it took each program to transfer a 275K file from one Mac to another. We tested the same file transfer running under both the Finder and MultiFinder. With the Finder active, Timbuktu is slightly faster than Carbon Copy Mac. When you're working under MultiFinder, the difference is far greater;

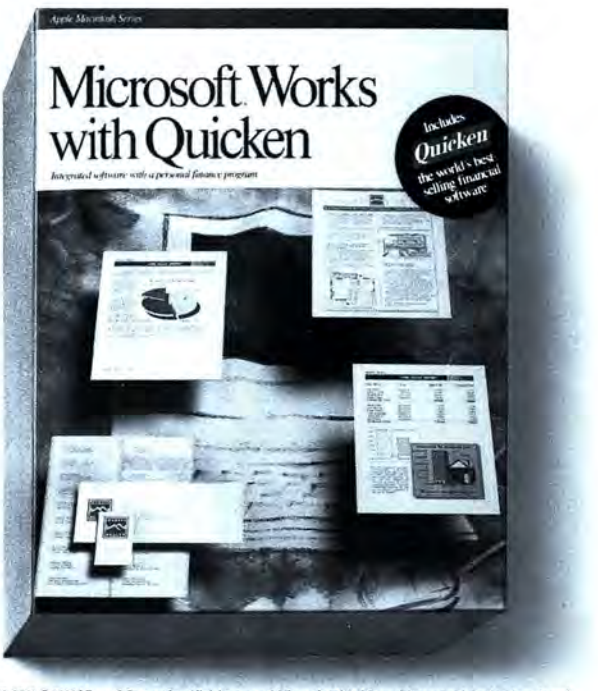
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Table 1: Features of Screen-Sharing Programs

	Timbuktu 3.1 ♦♦♦♦½	Timbuktu/Remote 2.0 ♦♦♦½	Carbon Copy Mac 1.0 ♦♦♦½
List price	$149	$195	$199 (two for $299)
Connection support	AppleTalk network	modem, serial	AppleTalk network, modem, serial
Compression	proprietary, always on	proprietary, always on	proprietary, user option
Custom modem scripts	NA	CCLs	proprietary
Depth of access security	complex	complex	simple
Number of guests allowed	limited by memory	limited by memory	limited by memory
Number of hosts allowed	limited by memory (multiple windows)	limited by memory (multiple windows)	one
Scrolling method	scroll bars	scroll bars	panning
File transfer in background	remote Mac only	remote Mac only	initiating and remote Macs
Copy protection	user enters serial number	user enters serial number	serial number hard-coded
Warranty	90 days	90 days	90 days
	Farallon Computing, Inc. 2000 Powell Street, Suite 600 Emeryville, CA 94608 (415) 596-9000	Farallon Computing, Inc. 2000 Powell Street, Suite 600 Emeryville, CA 94608 (415) 596-9000	Microcom Software Division 55 Federal Road Danbury, CT 06810 (203) 798-3800

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Forgot where you put a file? MacTools will find it by name or text in seconds and even let you view it to make sure it's the right one.



With MacTools daily backups are as quick and painless as taking your vitamins. Back up your whole disk or just the files or folders you want.



You wouldn't drive without a seat belt–don't operate your Mac without one either. MacTools copies critical volume information daily (or more often) to protect against hard disk crashes and accidental initialization.

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Carbon Copy Mac is much slower.

But wait — there's a really good reason for this difference! With Timbuktu, users who initiate a file transfer can't put the transfer process into the background; they must wait until it finishes to regain control of their Mac. With Carbon Copy Mac, file-transfer initiators *can* put the transfer into the background (still using MultiFinder, of course). So it may take much longer for the file to get where it's going, but the person who starts a transfer can do other work in the meantime.

And the Winner Is . . .

For people who need to share screens, any of these products can do the job. Farallon's Timbuktu is the most full-featured, with its ability to log on to several host machines simultaneously. It is an excellent product at a very good price. Timbuktu/Remote is also a good product, but given that it provides modem connections only, it's a bit expensive. For users who need to share screens over both network and modem connections, the combination of Timbuktu and Timbuktu/Remote is far too costly. For users who don't mind Carbon Copy Mac's main limitation — a user can be only a host or a guest (not both at the same time) — Microcom offers in Carbon Copy Mac a solid product that supports both network and modem connections at a much more affordable price than that of Farallon's Timbuktu and Timbuktu/Remote combination.

The Bottom Line

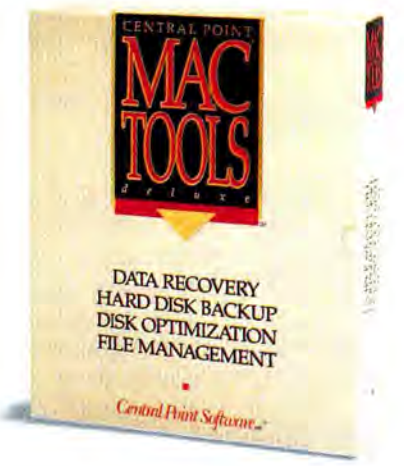
Timbuktu ($149), the oldest, most mature of the three screen-sharing programs we tested, is also the best. It performs well, and it has two significant features that Carbon Copy Mac — even when used over networks — lacks. It lets users "cascade" screens (one user can log on to a second user's screen, while the second user simultaneously logs on to a third user's screen, and so on). Timbuktu also lets a user log on to more than one other user's screen at the same time.

But Timbuktu supports only network connections. If you want both network and modem connections from Farallon, you must buy two products: Timbuktu (network) and **Timbuktu/Remote** (modem). Timbuktu/Remote costs $199 per user, which is pricey. When each user has to buy both products to get both connections, the cost is close to $350 per node. That's too expensive!

Carbon Copy Mac ($299 for a two-user pack) has a big advantage here: It offers both network and modem connections in the same package. But Carbon Copy Mac has one annoying feature: Users can't cascade screens, as they can with Farallon's products. A Mac can be either a host or a guest, not both. If you can live with this limitation, Carbon Copy Mac offers the best alternative for budget-conscious users.

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DATA RECOVERY	✓	✓					
Selective/intelligent search	✓						
Pause & view during undelete	✓						
Recover files in-place	✓						
OPTIMIZER	✓	✓			✓		
Visual display of fragmentation	✓				✓		
DATA PROTECTION	✓	✓					
FILE LOCATE	✓					✓	
HARD DISK PARTITIONING	✓	✓					
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Behavior Mod, Mac Style

When you can't afford to upgrade your network, try changing the way you use it. Printing habits are a good place to start.

By Kurt VanderSluis

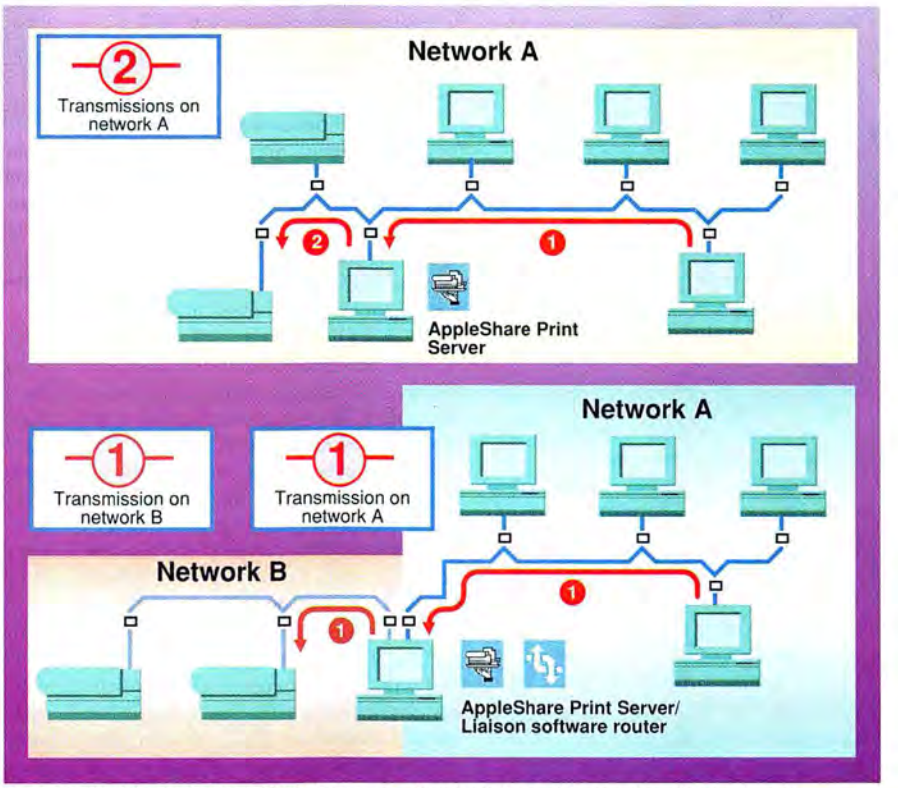


Figure 1: Apple's AppleShare Print Server, a network print spooler, can slow down network responsiveness. In the top configuration, a print job must travel the same network twice — from workstation Mac to spooler and from spooler to printer. If you install router software, such as Farallon's Liaison, on the server, you can put your printers onto a different network. In the bottom configuration, a print job still travels from workstation Mac to spooler and from spooler to printer, but the two network tasks occur on separate networks, lightening the original network's load.

Networks have a tendency to grow. They have a corresponding tendency to become overloaded. Users experience overloading as sluggishness when they try to print, send E-mail, or access a file server. Then they complain.

If you're a network manager, it's your job to solve these problems. This often involves redesigning the internet; dividing users into different groups; adding printers, servers, and routers to reduce traffic; and perhaps switching some users from LocalTalk to Ethernet. These are expensive solutions, however, and you don't always have the budget for a hardware-intensive redesign. In such instances, it's your job as network manager to help people learn to accomplish their business and computing goals by using network resources efficiently. (Actually, this is a good idea even if you do have a big hardware budget.) This month I'll take a look at some of the common ways people use networks inefficiently — albeit to accomplish valid business goals — and I'll suggest some free (or inexpensive) ways to improve efficiency. Some of them involve a minor network redesign, but others rely entirely on changing users' behavior.

Editing On-Screen

One of the most important ways people use AppleTalk networks is to share laser printers. Printing is also one of the most abused network services. Users figure: The printer's there; why not use it? Then they complain that the network is slow.

One printing practice I like to discourage is the printing of draft copies of documents. Novice computer users print drafts the most, because they aren't used to editing on-screen. Sometimes you can encourage them to try to

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do more editing on-screen and use the LaserWriter less. I jokingly tell them that I notice that their wastebasket and recycling bin are full of paper and that a few more trees could stand tall and proud if they got used to editing on-screen.

Another reason why people print drafts is that the Mac is not truly a WYSIWYG device, because it relies on QuickDraw for screen information and on PostScript for printed output. Sometimes on-screen items look very different from the same material in print. To people who want to see how their output looks on paper, you might suggest that they use a product such as ATM (Adobe Type Manager) that enhances an on-screen image to make it look more like actual output. (Version 2.0 of ATM is much faster than its predecessor, making this option a bit more palatable.) This may reduce the number of drafts they need to print.

Another practice that strains network resources is printing huge documents during the day on shared printers. Sometimes this can't be helped, but you can encourage users to do large printing jobs during off-hours. Sometimes investing in a large paper bin makes this more attractive, in that users don't have to contend with adding paper to the 200-page tray that comes with, for example, an Apple LaserWriter IINT. With a print spooler, users can specify when a job will get printed. The cheapest print spooler, PrintMonitor, comes free as part of Mac system software, but it requires that you have enough memory to run MultiFinder.

Those who use the ASPS (AppleShare Print Server), a network spooler, have probably figured out that although ASPS has a lot of benefits, one of the drawbacks is that all print traffic goes through the network twice — once to get from your Mac to the spooler and again to get from the spooler to the LaserWriter. You might try putting your printers onto a different network, which involves running ASPS concurrently with a software router such as Apple's Internet Router or Farallon's Liaison (see Figure 1).

Don't Print That Message!

Another practice I try to discourage is printing E-mail messages. One of the benefits of E-mail is that it can reduce the amount of paper in an office, but printing messages negates this advantage. Each time a message is printed, it has to be transmitted over the network twice if you use a network spooler. An E-mail message sent to 20 people and printed by 10 should probably have been photocopied.



Figure 2: I store E-mail messages in a custom Mailkeeper HyperCard stack, where I can find them easily with KnowledgeSet's HyperKRS search engine. By not printing messages, I save paper and use the network less.

But did all ten of those people really need to print the message? I've heard users give two main reasons for printing their E-mail. The first is that they want to keep a record of their correspondence so that they can reconstruct the paper trail that led to a decision or action. A reasonable goal, but you may be able to reduce network traffic if you can provide an electronic alternative to paper trails. Some E-mail packages such as QuickMail let you create electronic folders in which you can store old messages. If users on your network take advantage of this feature, encourage them to also avail themselves of another feature your E-mail program may have: the ability to store mail messages on a local hard disk, rather than on the mail server. Rereading a message stored on the server adds network traffic.

I use a message-storing database created in HyperCard. I wrote a custom script that creates the text of a message and copies it to the appropriate fields of a card in my Mailkeeper stack (see Figure 2). I use KnowledgeSet's HyperKRS as the basis of a script that searches my stack for cards that match the keywords I specify. This method works much better for me than keeping the messages in electronic or paper folders.

Another reason people give for printing their E-mail messages is that they are only in the office for a short time each day and they want to be able to read them later. Remote access to the mail server might be a worthwhile alternative for such users. Perhaps they already have a computer and modem at home or can borrow the necessary equipment from their company. Using a remote computer lets them respond electronically to messages as they read them.

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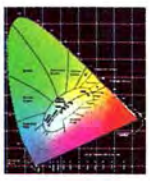
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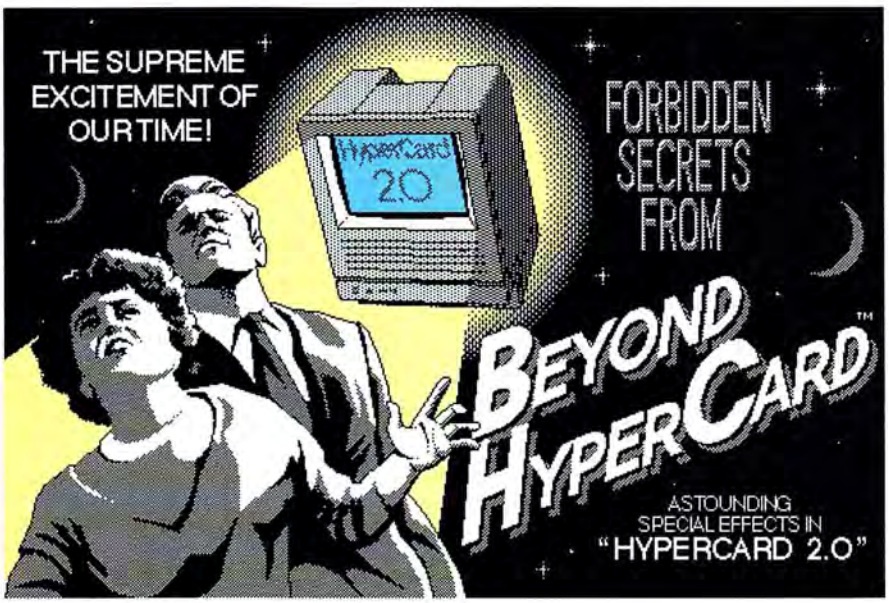
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HyperCard 2.0

It's been a long wait — but Apple (oops, Claris) is finally shipping HyperCard 2.0 (initially, with the new Macs). You can read Michael Swaine's review of the new version in this issue. For a different kind of look at what's new with 2.0, we turned to the two most creative stackheads we know — Rand and Robyn Miller. Here, and in an accompanying stack available exclusively on Zmac, the authors of The Manhole and Cosmic Osmo unearth for us the Forbidden Secrets from Beyond HyperCard.

By Rand Miller and Robyn Miller



First there was HyperCard, the powerful software that defied all classification but put the power of Mac programming into the hands of the people. Behind HyperCard's ease of use was the secret power of the HyperTalk scripting language, and now this secret power has been enhanced and improved. This article presents four ideas for new things you can do with HyperCard 2.0. If you want to see these ideas working in their finished form, you can download the complete Forbidden Secrets from Beyond HyperCard stack from the Zmac on-line service.

Our main purpose in this article is to give you an idea of HyperCard 2.0's new capabilities. We've included some HyperTalk scripts, but they're only a start. You should use them as stepping stones for your own projects. This article doesn't attempt to teach you HyperTalk scripting, but if you download the stack from Zmac, you can learn a lot by studying the complete working scripts.

Cool Revelations

Sometimes revealing forbidden secrets can be kind of cool. When developing stacks such as The Manhole and Cosmic Osmo, we always enjoyed trying to think of things to do with HyperCard that nobody else had thought of. It was while trying to think of ways to use HyperCard 2.0's ability to display color PICT graphics that we came up with the idea for the first of the four projects described here: Cool Revelations. You need to start with a new stack and a PICT graphic (in color if you have a color-capable Mac). HyperCard 2.0 can display color PICT graphics, and it lets you control a graphic's size, type, position, and scroll, and even its scale.

The idea is to create a card in a stack that has a simple black-and-white illustration on it. We used a map of an island for this example. The PICT graphic that we mentioned is an exact replica of this simple black-and-white illustration but with more or different detail or with color. By using some fairly simple HyperTalk handlers, we can let the user move a *viewport* around the card that appears to reveal some interesting

underlying details as it passes over different parts of the illustration (see Figure 1). See Example 1 for the key HyperTalk scripting that you'll need to get started.

HyperCard 2.0's Picture command is a built-in XCMD that opens a window with a PICT image on top of the current card. In our example, the fun really begins when you exploit HyperCard 2.0's ability to set parameters for the rectangle (the location and size) and to control the scroll (what part of the PICT it shows) of this new window.

In addition to setting these key elements, you also need to know when someone clicks in the picture. When that happens, HyperCard 2.0 sends a `mouseDownInPicture` message. The handler for the `mouseDownInPicture` message will need to move the picture window to the location of the mouse and set the scroll to correspond to that position. This handler can be placed in the card script, as shown in Example 2.

Menu Maker

Another new feature of HyperCard 2.0 is its easy access to the menu bar. You can create or delete menus; add, enable, or disable menu items; set the check mark; specify a menu message; and even reset the menus. Although HyperCard 2.0's menu-handling capabilities are easy to use, the number of options and combinations can make things tedious. A card that lets you construct a menu and then automatically produces the code necessary to implement that menu would be a useful feature.

The basic elements of a new menu are the menu name, the menu items listed under that name, and the menu messages that the menu items send when selected. A menu-maker stack in its most basic form should have fields for entering those elements. If you want to get fancy, you can add optional control of whether a menu item is enabled, disabled, or checked. When the menu information has been entered into the fields, clicking on a button should automatically do the HyperTalk scripting necessary to create the menu.

The two main tools for controlling menus in HyperTalk are the Create

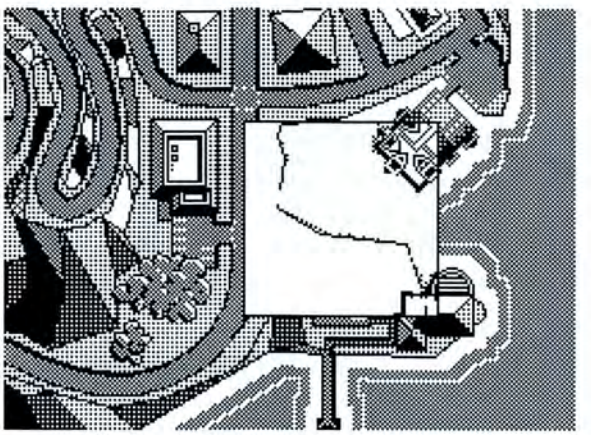


Figure 1: HyperCard 2.0 lets you display color PICT graphics in your stacks. By selecting what part of a PICT graphic is shown, you can create the illusion of a viewport that reveals hidden details as it moves around the screen.



Figure 2: Windoids have always been part of HyperCard, but version 2.0 lets you use the PaletteMaker stack to create them.

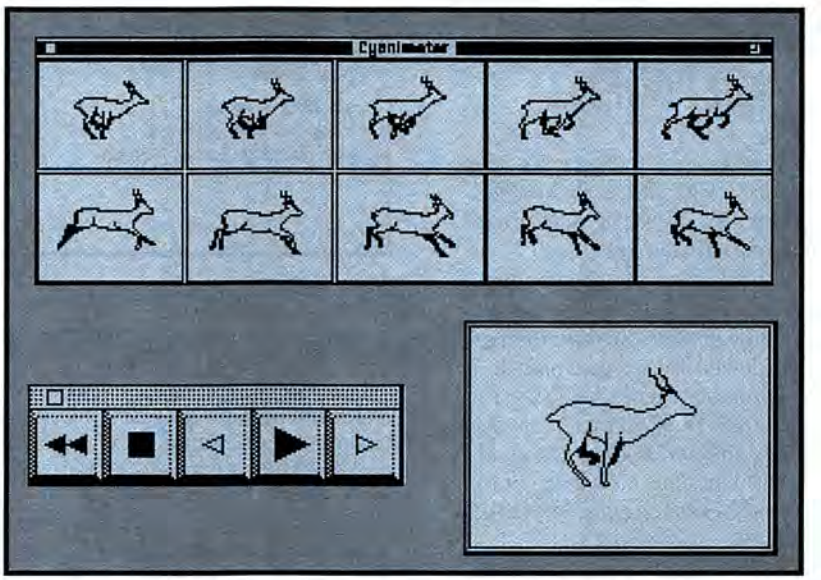


Figure 3: HyperCard 2.0's ability to work with odd-sized cards makes Cyanimation possible. By placing 20 images on one card and controlling the scroll location of the window, you can create a simple animation engine.

Example 1

```
picture "Island",file,rect,true
set the rect of window "Island" to "5,42,68,105"
set the scroll of window "Island" to "5,42"
```

Example 2

```
on mouseDownInPicture
  repeat until the mouse is up
    put the mouseH - 40 & "," & the mouseV - 40 into theloc
    set the scroll of window "Island" to theloc
    set the loc of window "Island" to theloc
  end repeat
end mouseDownInPicture
```

Example 3

```
create menu "Special"
put "Play" into menu "Special" with menuMsg "PlayItNow"
put "Stop" after menu "Special" with menuMsg "StopItNow"
```

Example 4

```
global GPath
put the long name of this stack into GPath
if GPath is not in the StacksInUse then
  start using GPath
end if
Palette "GroupRadio", "130,10"
```

Example 5

```
global GPath
stop using GPath
put empty into GPath
```

command and the Put command. There's a sample of both in Example 3.

Our menu-maker stack can use the information that was entered into the fields to do all the scripting for the desired menus, thereby saving the effort of typing numerous lines of HyperTalk code. The `menuMsgs` (`PlayItNow` and `StopItNow`) are handled in the card, background, or stack we've created.

Radio Grouper

If you've ever put radio buttons into a HyperCard stack, you know you're in charge of scripting a group of buttons so that clicking on one turns the others off. Wouldn't it be better if you could drag a box around the radio buttons to define a group and then have all the scripting done for you?

Anyone could have written the script to group radio buttons in the old HyperCard. But HyperCard 2.0 lets us use a *windoid* to make the function more accessible. (Windoids existed in HyperCard 1.0. You may have used the Link To windoid to quickly designate what card or stack you wanted a button to point to. A small window would appear after you selected Link To and then automatically disappear after you moved to the destination card or stack and clicked on OK.)

The first step in creating a windoid in HyperCard 2.0 is to use the PaletteMaker,

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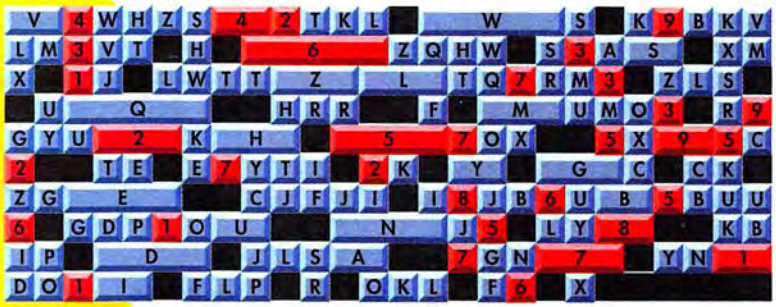
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Example 6

```
hide window "GroupRadio"
close window "GroupRadio"
```

Example 7

```
on goFrame Frame
  set the scroll of card window to "0," & (Frame - 1) * 128
end goFrame
```

Example 8

```
on nextFrame
  Global Frame
  add 1 to Frame
  if Frame > 20 then put 1 into Frame
  goFrame Frame
end nextFrame

on prevFrame
  Global Frame
  subtract 1 from Frame
  if Frame < 1 then put 20 into Frame
  goFrame Frame
end prevFrame
```

Example 9

```
on keyDown TheKey
  get charToNum (TheKey)
  if it is "28" then PrevFrame
  else
    if it is "29" then NextFrame
    else
      pass KeyDown
    end if
  end if
end keyDown
```

which comes with the authoring version of HyperCard 2.0. To make sure the palette is big enough to look like a windoid, you have to use a dummy button—otherwise the palette will shrink to fit the picture or the buttons. The Group Buttons button should have a script that says something original, such as `groupButtons`. The Cancel button should likewise be scripted with something such as `cancelGroupButtons`.

You can display this windoid, using the Palette command, and it will stay displayed until the user clicks on one of the buttons. Now here's the complicated part. The user can go to another stack, but the handlers for `groupButtons` and `cancelGroupButtons` are in the stack you just created. You can use HyperCard 2.0's new user-definable message hierarchy, which lets you send messages to your original stack even if it's not the active stack or if it's closed. In the same button script that displays the palette, we also add the stack to the list of places that HyperCard 2.0 checks for things that contain the `start using` command.

Line 1 in Example 4 sets up a global variable, `GPath`. Line 2 puts the full path to this stack into `GPath`. Line 3 checks to see if we already have access to the full path and, if not, starts using it in line 4. Line 6 is where the windoid is displayed. Putting the full path into `GPath` gives us easy access to it when we're ready to stop using it, as scripted in Example 5.



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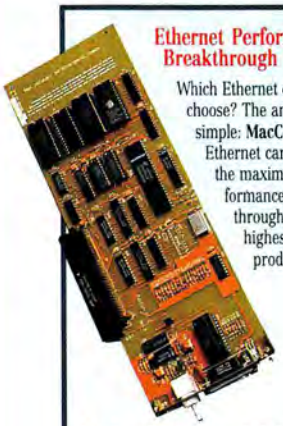
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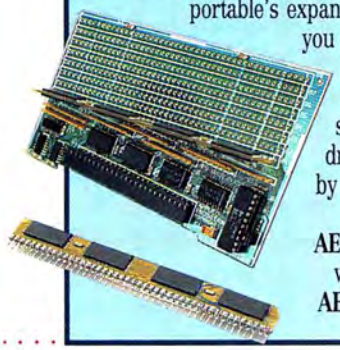
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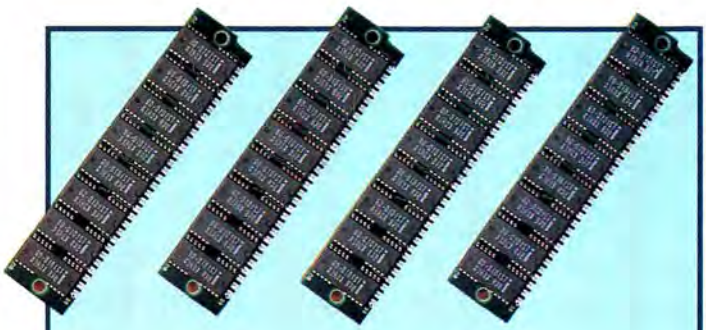
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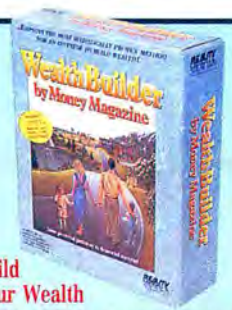
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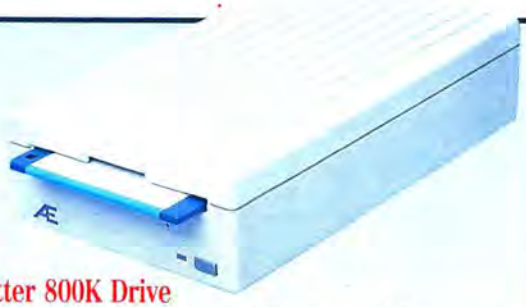
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HyperCard 2.0's Picture command is a built-in XCMD that opens a window with a PICT image on top of the current card.

There's one final trick you need to use when you create windoid applications such as this one. When you close a palette, it doesn't immediately disappear the way a real windoid would. Instead, it stays on-screen until HyperCard has finished running your scripts (idle time). You must hide a palette to make it disappear. This makes it go away immediately, and you can then close it at your convenience (see Example 6).

Cyanimation

Doing animation within HyperCard has always taken some creativity. You can flip cards, change the icons of buttons, or even create your own fonts. But now with the help of HyperCard 2.0's large card size (704 x 488 pixels, compared with the old limit of 512 x 342 pixels) and its ability to scroll to any position on a card, we can bring you the most bizarre type of animation yet — Cyanimation (modestly named after our stackware-development company, Cyan).

The key to Cyanimation is to use HyperCard 2.0's ability to create large card sizes to put every frame of your animation onto a single card and then reset the window size to show one frame at a time. By changing the scroll location of the window, through scripting control, you can instantly flip from one frame to the next.

The script in Example 7 assumes that the size of the stack window is 128 pixels wide and that each frame is therefore 128 pixels wide. (Don't forget that the stack itself is actually much wider than 128 pixels but that you're looking at only a 128-pixel-wide portion at a time.) If you do the math, you can see that when the frame number is 1, the scroll is at 0,0. When the frame goes to 2, the scroll is at 0,128, which moves you instantly to the next frame. Typing `goFrame 5` in the message box scrolls the card directly to

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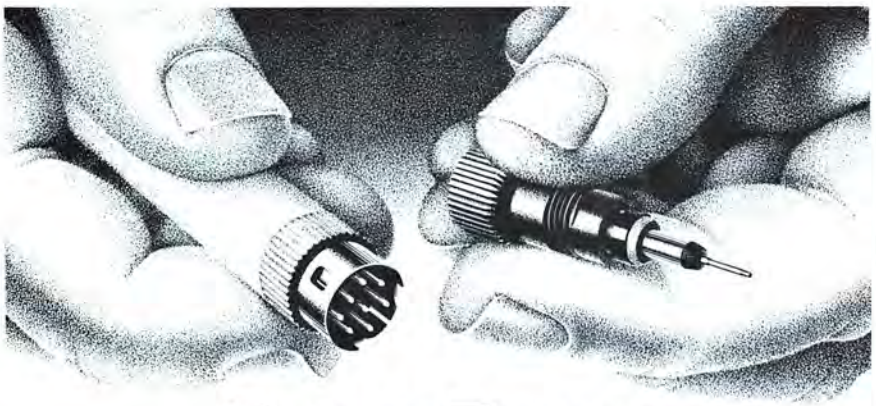


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The basic elements of a new menu are its name, the items listed under that name, and the menu messages.

the location of frame 5.

The script in Example 8 adds handlers for stepping forward or backward one frame at a time. Notice that these handlers are coded for up to 20 frames of animation. You can add a palette to control the frame flipping and create a really sophisticated animation tool (see Figure 3).

This is a good application for using HyperCard 2.0's ability to add a custom menu. You can duplicate all the palette controls with appropriately named menu items. You can even use the menu-maker stack to create the HyperTalk script for the menu in the Cyanimator stack.

Another new feature of HyperCard 2.0 is that it sends a `keyDown` message whenever a key is pressed on the keyboard. We can use this ability to intercept presses of the arrow keys to flip the frames forward or backward. We can convert a key press to its ASCII number, compare to see if it's a left- or right-arrow key, and then respond appropriately by moving forward or backward (see Example 9).

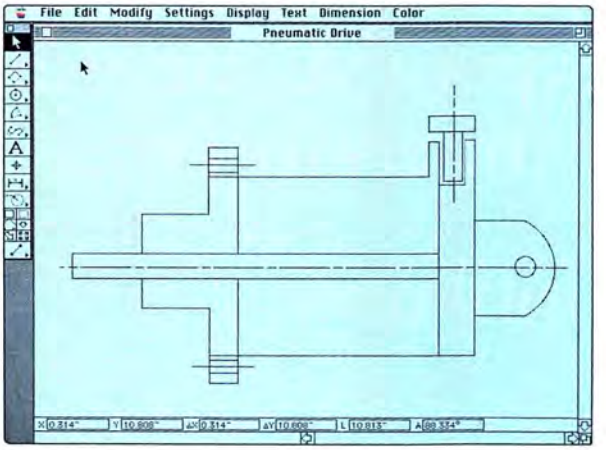
The animation artwork can be created or edited with HyperCard's painting tools, because the entire animation will reside on a HyperCard card. The possible number of animation frames depends on the size of each frame and the amount of memory in your Mac.

Script for Yourself

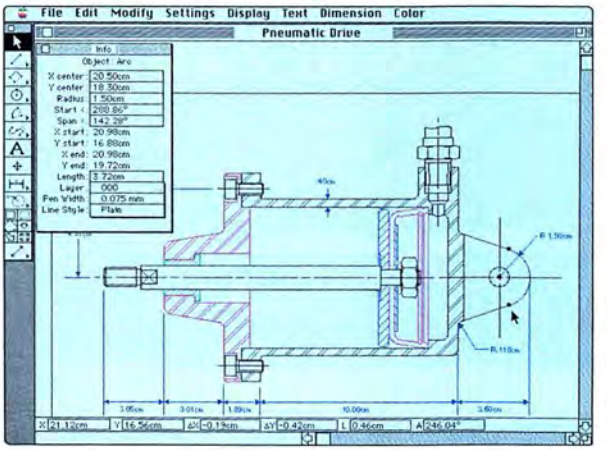
The best way to learn the secrets of HyperCard 2.0 is to experiment on your own. If you've never tried using HyperCard, now's the time to find out what it can do. The added power and flexibility of HyperCard 2.0 make it easier than ever to create customized solutions.

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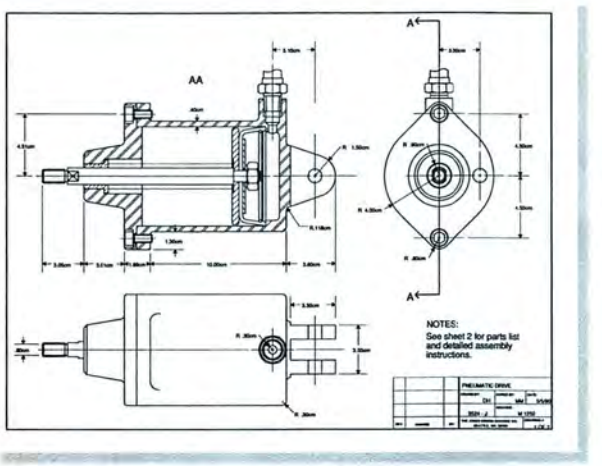
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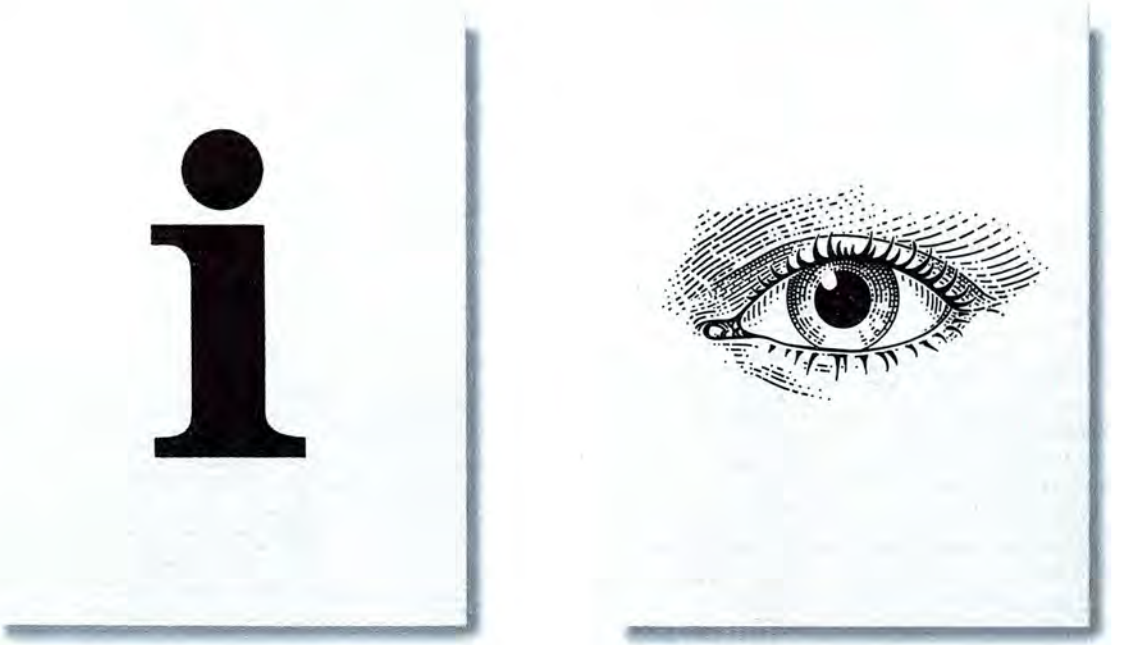
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12 Power Works Tips

If you aren't using all these features of Microsoft's integrated package, you aren't getting your Works' worth.

By Darryl Lewis

Long before there was a Microsoft Office, there was Works, Microsoft's integrated word-processing, database, spreadsheet, charting, and communications package. None of Works' individual programs is the most powerful in its class, but that hasn't stopped Works from becoming Microsoft's best-selling package ever. And with reason: Works is a rich computing environment that's capable of a surprising variety of operations. Here are 12 frequently overlooked or underused Works features.

The Draw Module

The Draw module is a hidden treasure that you can use only in conjunction with the word-processing or spreadsheet program. You can use it to dress up documents or as a graphics program. Objects and text created in the Draw module exist in a separate layer from the word-processing or spreadsheet information — similar to an acetate overlay — so you can read underlying text through a graphic if you choose.

The module lacks a vertical ruler and precise sizing tools — serious omissions, but you can precisely position objects in two ways: A snap-to-grid system lets you specify grid increments down to 1/36 inch or 1/14 centimeter, and the keyboard arrow keys and the directional arrows in the tool palette let you move objects one pixel at a time.

Spreading Text

Works' Draw module has some exotic features. It can make text follow and spread evenly along an arc or diagonal line (see Figure 1). You can also use this technique to adjust letterspacing.

Cut or copy your chosen text to the Clipboard, and draw an arc or line in the Draw module. Make it invisible by selecting White or No Line on the Line Pattern menu, and then select the Spread Text command on the Format menu. Each letter becomes a separate draw object that you can move or size independently. If you group the letters, using the Group Picture command on the Format menu, you can stretch or distort them.

Desktop Publishing

Yes, you *can* create multiple-column newsletter pages and fliers with Works. To create columns, select the text tool from the palette and hold down the Option key while you draw text frames, just as you would in a desktop-publishing application. To link columns, hold down the Option key and, with the pointer, click on the columns in the order you want. Headings above each column indicate the name or number of the current column and the column it is linked to. You can edit these headings manually with the text tool.

Once you've created the columns, typed or pasted text flows from column to column. This doesn't work as smoothly as it does in conventional DTP applications — you must deselect a column before text reflow occurs — but for occasional use, Works is a competent desktop-publishing application.

Better-Looking Charts

Works is at its best when you use two or more modules together. You can't edit a Works chart in its own window, but if you paste it into a spreadsheet, you can edit it by using standard draw techniques.

To improve a chart's appearance, use the Ungroup Picture command on the Format menu. This breaks the chart into individual draw objects. You can then pull a wedge out of a pie chart, change the fill or line patterns, add additional text labels, circle important information, or draw lines with arrowheads.

Make Works Desktop

The Make Works Desktop command on the File menu creates a file (its icon looks like a desk) that remembers groups of Works documents: Open that file, and you automatically open the whole group. You can use this features to file any kind of linked documents, such as letters or mailing labels.

Creating a Works Desktop file is simple: Choose the Make Works Desktop command

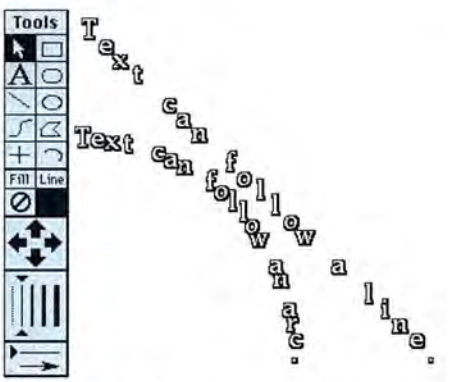


Figure 1: Works' Draw module has some powerful features — such as the ability to spread text along an arc or to fit a particular space.

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Figure 2: This on-screen invoice was created with Works' database program. The Extension Price, Subtotal, Sales Tax, Total, and Current Balance Due fields are self-calculating.

on the File menu while the files you want to include are open, and then name the new file.

How can you put this feature to practical use? Try creating a check-writing module with the Make Works Desktop command. You'll need three Works files: a database that contains all the information that will appear on the check, another database containing a list of companies to whom you write checks regularly (including the check amount, in some cases), and a word-processor document that prints the checks by merging the data from the check-register file. Name this Works Desktop file Banking; double-clicking on it gives you instant access to the three files you need to write checks.

Calculated Database Fields

Figure 2 is an invoice set up in Works' database program. This form automatically calculates the extension prices, sales tax, and total as you enter quantities and unit prices. The Current Balance Due field gets the unpaid balance by subtracting the payments from the total.

Adding self-calculation to a Works database is easy. Select the field to which you want to add a calculation, and then select Set Field Attributes on the Format menu. This lets you choose the field type (numeric, date, or time only — you can't calculate text). Then check the Computed box, and click on the OK button to return to the database window. You'll notice an equal sign in the entry bar. That's your signal to enter the formula that will calculate this field.

You can add values from other fields to a calculation by clicking on the fields. Type subtraction, multiplication, and division signs as needed from the keyboard (if you don't type an operator, Works assumes you want an addition sign).

Date and Time Shortcuts

Works provides a shortcut — Command-D — for entering the current day's date into a date field in a database. For time fields, Command-T has an analogous effect.

Alternatively, you can enter a date in the current year by typing month/date (12/22, for example), and Works automatically adds the year. This shortcut works even if you want to display the date in medium or long format; Works will display the date in your chosen format.

Report Totals

Works lets you subtotal and total a report's numeric fields by using the TotalsPage menu. Here's how it works: To print a report of total sales from the Figure 2 database, start by sorting the database alphabetically by the Customer field and then run the report. If you then select both the Customer field in the report and Take a Sub-Total on Field Change on the TotalsPage menu, a subtotal will be printed each time the customer name changes. You can then select the fields you want totaled by selecting the Subtotal field, which represents total sales, minus sales tax and shipping. Select the Sum This Field command on the TotalsPage menu, and do the same for the Sales Tax, Shipping, and Total fields. These fields will now print subtotals for each customer as well as grand totals at the bottom of the report.

If you need only the subtotals and total rather than the whole report, you can get them by selecting the Copy Totals command on the Edit menu when the report is on-screen. This places the subtotals and total on the Clipboard, from where you can paste them into a spreadsheet or word-processor document.

Mail-Merge

All major word processors can print form letters and labels for each entry in a mailing list, but Works does the job a lot more smoothly.

The Works word processor reads directly from the program's own database, so there's no need to export the text to be merged. Because of this dynamic





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Which Saves You 47%?

Unlike Radius, you can purchase your PixelView display system direct from the factory. That means savings. No middleman. No retail mark-up. That's why you pay 47% less for our PixelView II.

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Our PixelView I 15" portrait display was designed to take a minimum amount of desk-space, while giving you a full page on screen. And of course it works with any Macintosh Plus, SE, SE30, or II.

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	Radius Pivot	Mirror PixelView II	Mirror PixelView I
Screen size	15"	19"	15"
Viewing area (sq. in.)	90.77	151.58	90.77
WYSIWYG (72 dpi)	No	Yes	No
Vertical refresh	69	78	75
Pop-up Menus	No	Yes	Yes
Tear-off Menus	Yes	No	No
Enlarged Cursor	Yes	Yes	Yes
Enlarged Menubar	Yes	Yes	Yes
Screen Saver	Yes	Yes	Yes
Screen Copy	Yes	Yes	Yes
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Billing Address:	Shipping Address:
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Terms: Cash | Salesperson: JRS

Quantity	Description	Unit Price	Extension
100	8 1/2 x 11 photocopies	$0.05	$5.00
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20	Boxes of paper clips	$0.75	$15.00
	Subtotal		$32.50
	Sales Tax		$1.95
	Shipping		$4.00
	TOTAL		$38.45
	Payments: 6/30/90		$12.00
	6/4/90		$14.00
	6/30/90		$12.45
	BALANCE DUE		$0.00

Thank you for your patronage

Figure 3: In this print-merged invoice, the letterhead, descriptive words, and thank-you blurb were typed directly into the word processor. The customer, sales, and dollar information were merged from the Figure 2 database record.

linking, form letters and mailing labels are only the start of what Works can do.

To print the invoice for the sale displayed in Figure 2, you would start by creating an attractive invoice in the word processor (using the Draw module to dress up the form) and merge the necessary customer, sales, and dollar information into it.

In the invoice in Figure 3, the letterhead, information (Invoice Date, Customer), and thank-you blurb are typed in the word-processor document. The customer, sales, and dollar information are read directly from the database.

You enter information placeholders in the word-processor document by using the Prepare to Merge menu command and dialog box. The placeholder tells Works to look in a specified field in the current database record and display whatever information it finds.

If you make a change in the current record or display a different one in the database, the new information will immediately be displayed in the word-processor document. This means that you need to set up the invoice form only once. After entering new sales information into the database, just open the invoice form and print.

The word processor has both standard Print, which outputs one copy of the word-processor document for the currently displayed database record, and a separate Print Merge command, which prints a copy of the word-processor document for each record in the database.

Telecommunications Sessions

Many communications applications forget text that has scrolled beyond the top edge of the window. To review a session later, you must save the screen text to a disk file. This approach has two disadvantages: The file can't be read while the communications session is in progress, and you need a separate word processor or text editor to read the file. But what if you just want to reread information from three screens back?

During a session, Works can remember up to 100 previous screens (the more screens you select, the more memory you need).

Works also permits up to 14 windows to be open simultaneously and supports background communication, uploading, and downloading. You can save text from the screen into a new document, and you can also paste text you want to transmit into the communications window.

Presentation Spreadsheets

Like a high-end spreadsheet program, Works lets you insert charts within a spreadsheet. The main difference is that it's easier in Works: Starting with a chart window on-screen, select the Copy command, switch to the spreadsheet window, and paste in your chart.

Unlike some high-end spreadsheet programs, Works lets you ungroup your charts after you've drawn them. Select Ungroup Picture on the Format menu, and you can adjust the placement of bars, legends, titles, and so on. (Excel users: You can't alter charts in this way in Excel, but you can paste your Excel charts into Works and alter them there. You won't be able to move the altered chart back to Excel, though.)

Spreadsheet Cell Notes

Cell notes are like Post-it notes that you can attach to individual cells. Use them for comments about the calculation for the cell or instructions about what to enter. This information, although useful, is unnecessary in the main display.

To create a cell note, select the cell you want, select the Open Cell Note command in the Edit menu, and type your message in the cell-note window. The notes are saved with the document, and a mark appears in the upper right corner of any cell that has an associated note.

Someone Has Some Explaining To Do.



The Mirror Trinitron uses Sony's patented Trinitron tube for the sharpest color image available.

The Mirror Trinitron comes with an 8-Bit Interface (MacII or SE30) that delivers 256 vivid colors, and software enhancements like Pop-up Menus, Enlarged Cursor and Menubar options, Screen Saver, and Screen Copy.

The Mirror Trinitron is available direct from the manufacturer without any Rep commissions or Dealer mark-up.

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We've long admired the Radius Trinitron Color Display. That's why when we designed our first color display system, we chose to include many of the same concepts. Such as Sony's patented Trinitron tube which is now the defacto standard for the Macintosh. And an 8-Bit Video Interface that delivers 256 colors. And software enhancements like Enlarged Cursor, Enlarged Menubar, Screen Saver, and Screen Copy. And a built-in tilt and swivel base.

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The fact is, in deference to Radius, we've had a much longer time to design a color display. That's why we've been able to build in some important differences. Here are just three:

1. Our ProView Interface delivers 256 color at 72dpi for true WYSIWYG scale so that the image on screen is the same as what you'll get from your printer.

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Tear-off Menus	Yes	No
Enlarged Cursor Option	Yes	Yes
Enlarged Menubar Option	Yes	Yes
Screen Saver	Yes	Yes
Screen Copy	Yes	Yes
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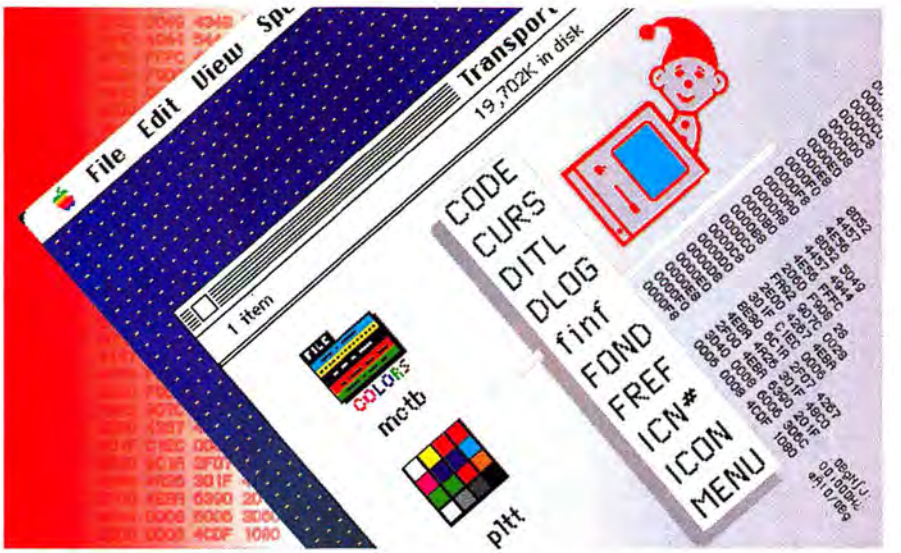
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Return to ResEdit

The newest version of ResEdit makes it easier than ever to customize your Mac and amaze your friends.

By Michael Swaine



ResEdit isn't just for programmers: It's a tool for every serious Mac user. That's because there's a new version out that is easier to use, is more powerful, and has a manual. And there are several ways of using ResEdit that have nothing to do with programming. Here are three types of ResEdit tasks that any user might find useful.

Trivial tweaks. Your friends may call them frivolous, but deep down they'll envy your custom menus with rearranged, hierarchical menu items sporting bullets; spot color; and selective, tasteful underlining and boldfacing.

Interface refinements. Apple didn't do everything right. At least not for you, your department, your company. You can refine the generic Mac interface to better serve your needs, with more-targeted dialog-box text, more-helpful help.

Essential fixes. There are some changes you need to make for your software to perform properly. These aren't merely matters of cosmetics or convenience: When the time comes that you really need more than 13 files open at once, you should know how to override this default limitation.

ResEdit knows about resources, and so should you. Every Mac program, including the System and the Finder, stores much of its functionality in resources, which you can examine and alter without having to rewrite and recompile the program. Typefaces, icons, dialog boxes, menus, and cursors are examples of what is stored in resources. This arrangement allows even nonpower users to modify programs and System software.

That's what ResEdit is for: It's a resource editor. Version 2.0 has some new features, but more importantly, it has a new, more graphical interface and a good manual. The specific version current as I write this is 2.0b2, which is not a final release, but this should not deter you. ResEdit spends most of its life in the beta (testing) stage of development. Even the manual is beta or, as Apple puts it, a development document. Both work fine; you should just remember always to work on copies of your files.

A Few Trivial Tweaks

Let's look closely at how you might use ResEdit to personalize your user interface.

When you first invoke ResEdit, you see a goofy-looking jack-in-the-box head bobbing up and down. Let's say, for the sake of argument, that you like this picture. Let's grab it and put it to use elsewhere.

Choose Open from the File menu, and choose ResEdit itself as the file to open. (It is vastly wiser to work on a copy of any file you edit with ResEdit, and this is even more important when you're editing System files or ResEdit itself. We won't actually change anything in ResEdit, although it's interesting to note that ResEdit can edit itself.)

You now see a window full of icons. Scroll down to the PICT icon, which represents all the PICT picture resources in the file. Double-click on it to open it, and scroll through the individual PICT resources until you see the jack you like (there are several). Click once on it to select it, and choose Copy from the

Edit menu. Now close all the windows. You've got the picture on the Clipboard.

Open another application (a copy of an application, that is), and make sure the application has a DLOG resource icon, because we're going to paste the picture into a dialog box. Select Paste from the Edit menu. This pastes the PICT resource into the new application; click on the PICT icon, and check that it's there. Also note its ID number.

You've copied the PICT; now you need to tell the dialog box about it. Double-click on the DLOG icon. This brings up a list of all the dialog boxes this application presents. Double-click on one to open it, and you will see a miniature representation of the dialog box. Keep looking until you find one with some empty space into which you can paste the picture of the jack-in-the-box. (You can resize the picture, so don't worry about exact size.) When you find a dialog box, double-click on it and then select Create New Dialog Item from the Resource menu. In the dialog box that pops up, select PICT. Type in the ID number you noted a paragraph ago, position and size the picture by dragging its corner, close all windows, and quit. Whenever you encounter this dialog box in this application in the future, you'll see it enhanced by the jack-in-the-box (see Figure 1).

Similarly, you can enhance menus by adding color, keyboard command equivalents, or icons to individual menu items, and you can change their text style individually. If the application was written just right, you may even be able to rearrange the items in menus.

You can also change the default locations of windows. If you normally boot your word processor and another application under MultiFinder, you can force the two applications to place their default document windows side by side.

I've already described how to change screen-layout settings by editing the Finder LAYO resource (see "Windows of Opportunity," July '90, page 221). You can get a nice effect by toggling the Color Style setting in the LAYO resource.

And you can edit icons. System 7.0's new icon philosophy gives you a whole family of icons to play with, in various sizes and depths of color.

Interface Refinements

But there's more to ResEditing than playing with colors and icons.

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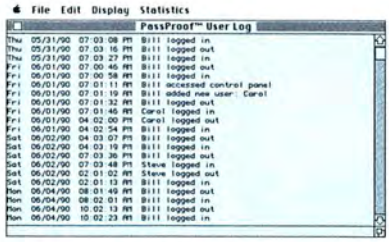


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BEATING THE SYSTEM

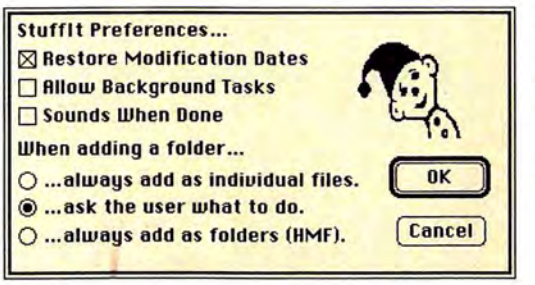


Figure 1: Copying a PICT resource from one application to another is easy with the new ResEdit. Here, the ResEdit jack-in-the-box makes a cameo appearance in a StuffIt dialog box.

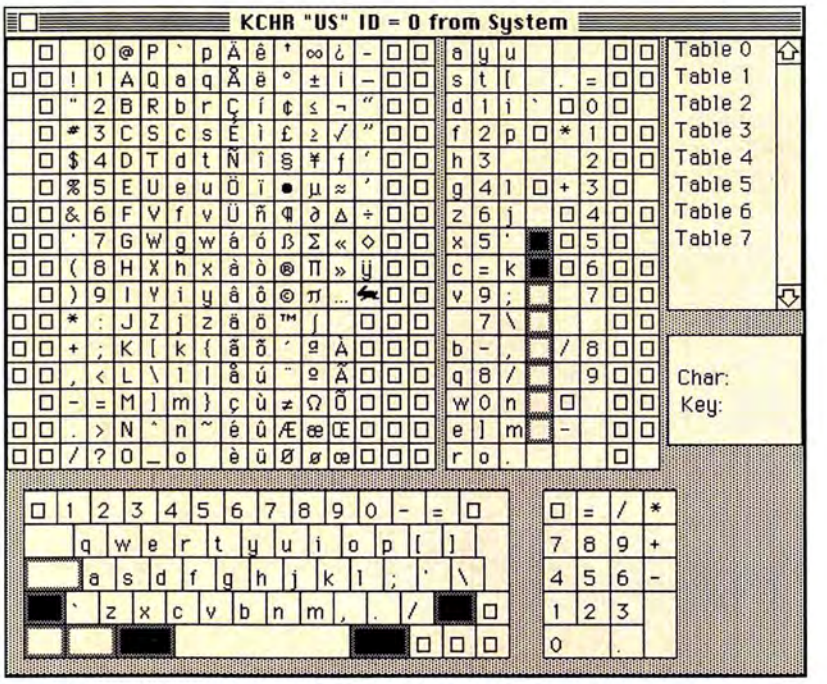


Figure 2: The KCHR resource is where you assign or reassign keystroke combinations, modifier keys, and dead keys — all the different ways of accessing exotic ASCII characters from the keyboard.

INTL resources. The most obvious change is the order of elements in short-date format: If you prefer D/M/Y to M/D/Y, you can have it. Just open a copy of the System file in ResEdit, select its itl0 resource, and choose a date format.

As I mentioned last month, System 7.0 will have a nifty feature called balloon help. Point at something when you're using balloon help, and a word balloon pops up to explain what the thing is and what it does when you click on it. Apple has done a good job of ballooning the Finder in System 7.0: If you point at a grayed item on a menu, a balloon will tell you what it means for an item to be grayed, why this one is grayed, and what to do to ungray it. Nevertheless, you might someday want to change these helpful help messages. It's easy, because the message text is stored in resources.

This suggests a theme for several other editing possibilities: A system administrator might want to customize various system messages for naive users or for the particular on-line-documentation needs of a particular site. Apple does a good job of localizing software for different countries and languages, but if, for instance, you're setting up Macs for English-language use in the U.S. by people whose native language is not English, your on-line-help needs may be peculiar. In general, you can speak your employees' language better than Apple can, so you may want to customize whatever language Apple has used.

You can even change the defaults for dialog boxes if you notice that Apple's defaults are not intuitive for your users.



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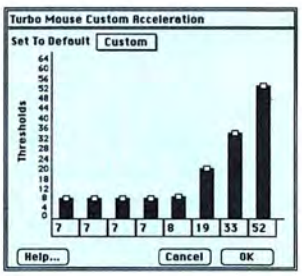
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Some Necessary Fixes

But these are still optional measures; there may come a time when you have no option — when you really *need* to change a resource.

Just as you can change the default locations of windows, you can relocate alerts and dialog boxes. This isn't just a simple matter of interface cosmetics or convenience. If you've ever been confronted with a dialog box that hides the very information you need in order to respond to it, you know this situation. Apple recently introduced nonmodal dialog boxes to solve this problem in future software (that's a fancy way of saying that you will be able to move the boxes out of the way). In the meantime, you can change the default position of an application's dialog boxes only by editing its DLOG resources.

You can also use ResEdit to edit fonts. PostScript (and soon, TrueType) fonts are another matter, but you can edit current bit-mapped screen fonts. You want to be careful of copyright restrictions, but you can modify an existing font to create

20 Questions for System 7.0

System 7.0. It's Apple's worst-kept secret and its best hope for meeting the Windows challenge. Delayed repeatedly in its release, features stripped away right and left, it will have to perform superbly when it finally does hit the streets. We talked with System 7.0 about several of its new features at its home on our hard disk and found it surprisingly confident.

MacUser: *So your new Finder finds; so what? You've always had Find File.*

System 7.0: My new Find facility is much faster and follows the shortest route to the file. It's also very fast at searching across a network, because it instructs the server to search locally. It can search on anything I know about a file, and that's a lot.

MacUser: *Is it true that you won't let me turn off MultiFinder?*

System 7.0: That's right. MultiFinder is no longer optional.

MacUser: *I hate MultiFinder. It clutters up the screen with windows.*

System 7.0: That's not exactly a question, but I have an answer anyway. I'll let you hide applications. This is a good feature; tell me to hide an application, and I'll make all its windows go away without actually closing it. Unhide it, and I redisplay all the windows immediately. You get a performance gain from this, because I don't have to spend so much time updating the screen.

MacUser: *Fine, but what if one of the applications open under MultiFinder crashes? I suppose you hang and make me reboot?*

System 7.0: No. Rebooting is as painful for me as it is for you. I'll kill hung applications for you without the trauma of a reboot. Just give me an Option-Command-Escape command.

MacUser: *Count on it. Will you let me have multiple invocations of a single application?*

System 7.0: Generally, no; it depends on how the application was written.

MacUser: *Will you still support DAs?*

System 7.0: I've made it harder to write DAs, and there's now less reason to write them, because both DAs and applications can be placed on the Apple menu and opened from there. But I'll still support them as processes.

MacUser: *What's a process?*

System 7.0: I'm glad you asked. A process is an open DA or application. All processes are automatically listed under the cooperative multitasking icon at the right end of the menu bar.

MacUser: *First "Option-Command-Escape" and now "cooperative multitasking icon." Have you been hanging out with DOS lately?*

System 7.0: One *MacUser* editor has suggested calling the cooperative multitasking icon the "process server." Maybe you'll find that more mnemonic.

MacUser: *Fer sure. Can I turn off virtual memory?*

System 7.0: Of course. In fact, only *you* can turn it on or off. Applications that want VM on or off will have to ask you to set it for them.

MacUser: *How do I turn it off?*

System 7.0: Your user interface for memory management is a cdev called Memory. I trust that's mnemonic enough for you. You can use it to turn 32-bitness or virtual memory on or off or to adjust the size of the cache.

MacUser: *Can applications use more than 8 megabytes?*

System 7.0: There's no practical limit other than the size of your hard disk.

MacUser: *Do I still have to allocate memory to applications myself?*

System 7.0: You do. VM only extends the apparent RAM of the machine; the programming is unchanged.

MacUser: *Will there be compatibility problems with virtual memory?*

System 7.0: Most applications are already virtual-memory-compatible. Problems are most likely to occur with scanner software and other software that manipulates hardware or processes hardware interrupts. Anything that talks SCSI should be written as a driver. NuBus masters may need a rework.

MacUser: *I didn't follow that; it sounded like programmer advice. But I have heard that multimedia stuff is likely to have trouble with virtual memory. Is that true?*

System 7.0: Sadly so. Sound applications should be all right if they use my new Sound Manager, which has been upgraded to be compatible with VM. But for video and the like, you should turn off VM.

MacUser: *You said something about 32-bitness. What's that?*

System 7.0: If you didn't follow what I said about NuBus masters, I seriously doubt that you'll understand about 32-bitness. Suffice it to say that most applications are 32-bit-clean, and that's good.

MacUser: *What about upgrade ROMs for old machines that are not 32-bit-clean?*

System 7.0: You do know something about this! That possibility is under discussion and will be announced to the developer community shortly.

MacUser: *Can I get at the Finder info about an application when it's open?*

System 7.0: Now, yes.

MacUser: *And the trash no longer empties on whim, right?*

System 7.0: It was never a matter of whim. But you're right. Now I leave it to you to take out the trash.

MacUser: *Well, you've certainly got some nifty features, System 7.0. I understand that a few features had to be dropped in order to get you back on schedule, though.*

System 7.0: That's a vicious rumor. I've never been on schedule. Ha ha. Just kidding.

MacUser: *So, when's the big day?*

System 7.0: Sooner than you think.





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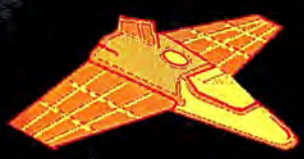
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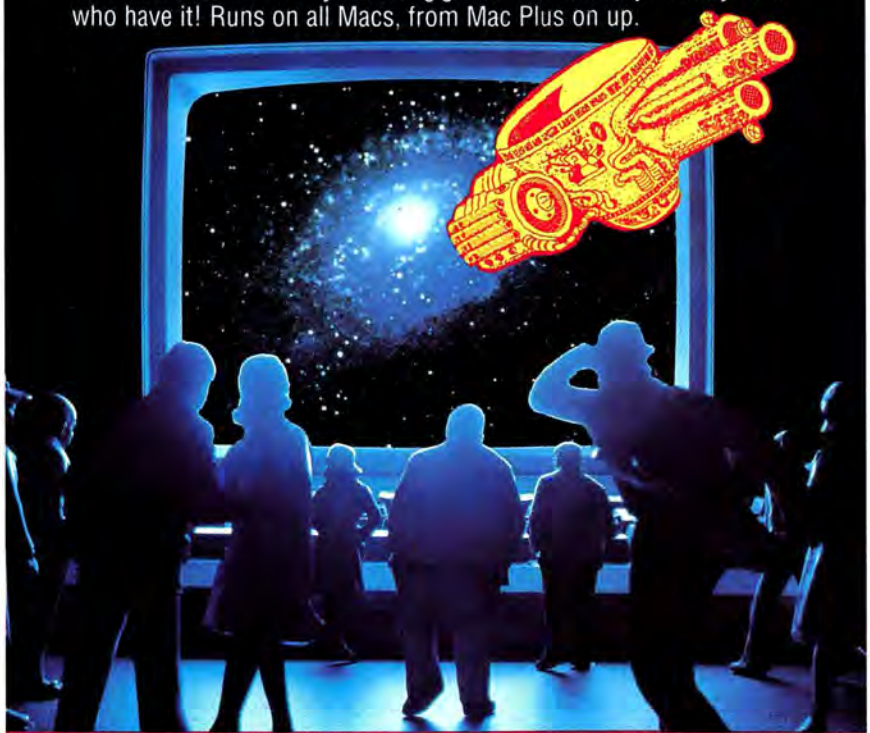
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One of the more obscure resources is KCHR (see Figure 2). This resource has nothing to do with fonts or typefaces but controls the mapping between the keys on the keyboard and the characters of the Mac (ASCII) character set. These ASCII characters are just abstract 8-bit data objects; they become particular printable characters only when interpreted by a particular font.

What you might find a KCHR resource good for (where you'll find one is in the System file) is for creating new interpretations of modifier-key combinations. The Shift, Caps Lock, Option, Command, and Control keys can all modify the action of any key pressed with them, and you can change the modification. This doesn't mean that you can set a modifier-key combination to perform an action such as opening a file; you need a macro program for that. All KCHR lets you do is associate a particular ASCII character with a particular key combination — but this can come in handy.

You can also use KCHR to decouple paired modifier keys on an extended keyboard so that the Option key on the right acts differently from the Option key on the left, for example. And you can create new dead keys, which do nothing until they're pressed in combination with another key, usually adding a diacritical mark to the character. Or you can simply examine KCHR to see what dead keys are defined.

Note that editing resources is not the exclusive province of ResEdit. There are specific third-party editors for many of the most common resource types. ResEdit is itself a collection of resource editors, including color pickers and bit-map editors.

You can get ResEdit and its manual from APDA/Apple Computer, 20525 Mariani Avenue, M/S 33-G, Cupertino, CA 95014; (408) 562-3910. The reason ResEdit is sold through APDA and lives most of its life in beta is because it is officially a development tool. But far from being exclusively a programmers' program, ResEdit should be seen as a behavior-modification tool for Macs.

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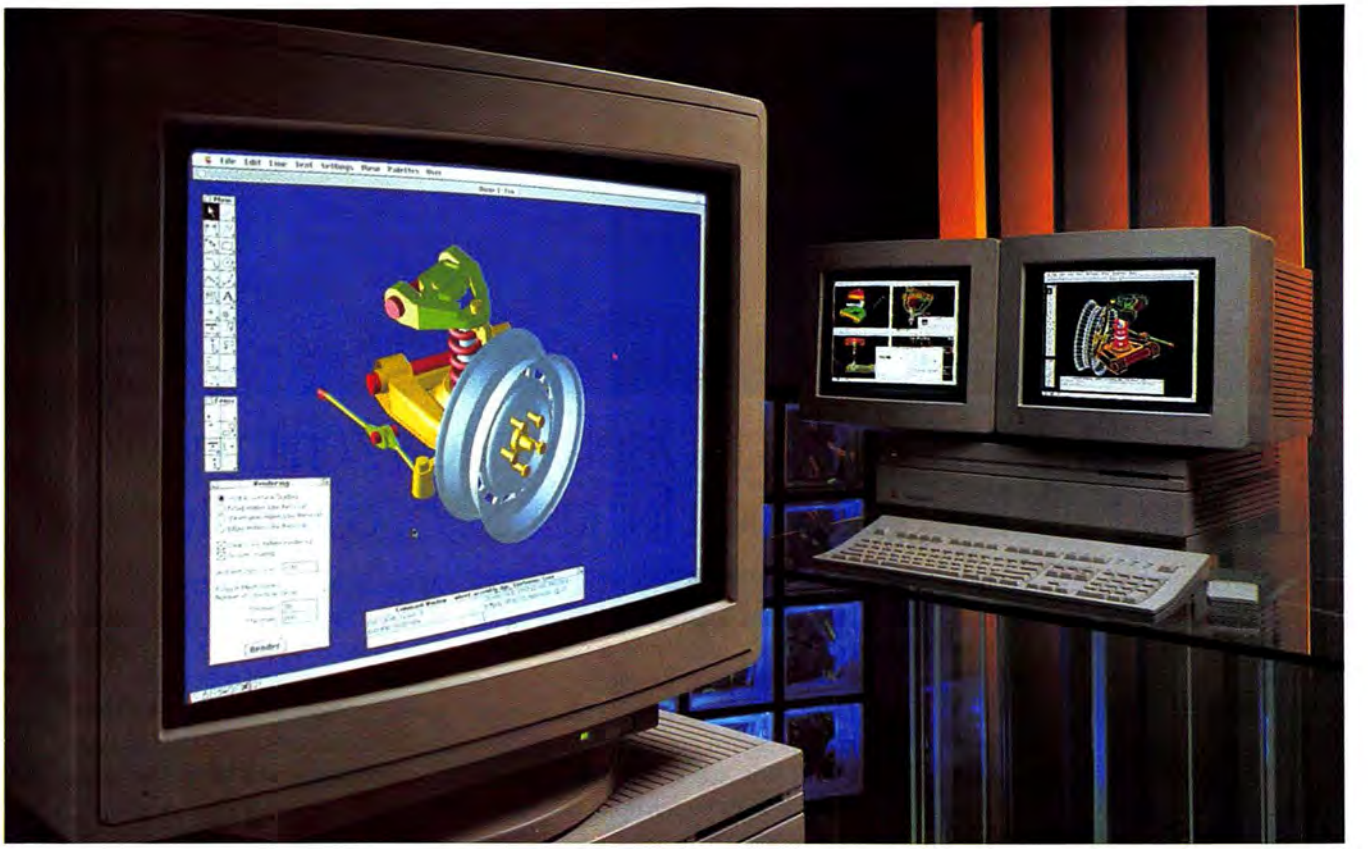
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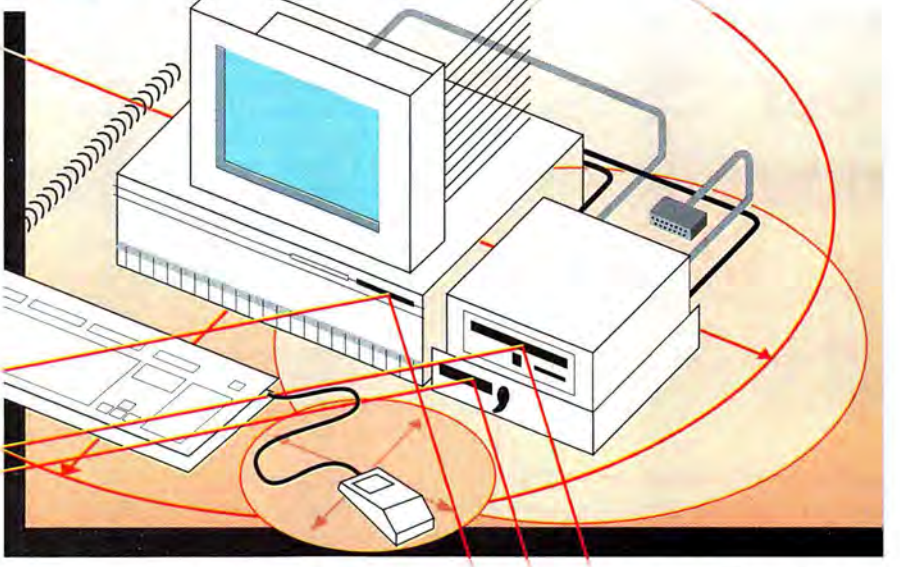
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Home Ergonomics

Does using a Mac have to mean spaghetti cabling and an aching back? Not necessarily. Here's how to set up your computer — and why it matters.

By Thom Hogan



Have you ever noticed how everyone is eager to tell you what new gadgets and software to buy but no one wants to spend any time helping you once you've bought them? Even more problematic is that many users are never told how to set up and deal with their systems on a day-to-day basis.

Once in a blue moon, a magazine article will pay lip service to the issue of ergonomics but mostly as a ploy to get you excited about the latest in chairs, desks, monitor stands, and other gadgetry. And then there are the rare and frightening articles that speculate on just how many "geboogles" of "electrostuff" your system emits, with dire warnings about your inability to procreate without mutations if you continue to use your Mac daily.

Is this what working for a consumer magazine is all about? Let's see if I can provide a little common sense to contrast with the marketing hype and scare stories you might otherwise be reading this month. I want to cover two basic areas: hardware setup and hardware in day-to-day use.

Setting Up

I'm pretty amazed by some users' hardware setups. Boxes and wires are strewn haphazardly across working surfaces, no thought is given to how much the various items are used and needed, and the emphasis seems to be on speed of setup rather than comfort. And let's face it, hardware manufacturers don't help things, do they? Cables always plug in to the least accessible place on the box, and many units — such as the video monitor — require two cables where one would suffice: If I'm going to plug my monitor into the Mac's power outlet and video output, why not give me just one cable to deal with? (NeXT has the right idea here).

The laws of hardware setup are many, but several are universal enough to be mentioned up front:

- You always need more power outlets than you originally estimated.
- Cables that manufacturers supply are rarely long enough to provide a decent setup.
- If something can be knocked over accidentally, it will be.
- At least one component you buy will have nonstandard connectors or will require some out-of-the-ordinary connection.

Dealing with outlets should be easy. Before you even begin to set up your machine, buy the largest power strip you can find. If you really want to do it right, make sure the strip is grounded (and that you correctly ground your equipment at two-prong outlets) and that it includes at least some sort of minimal surge protection. If you're going to move your computer from room to room, install a protected power strip in every room. Yes, I know you think you need only one outlet for your Mac, in the living room, because you enter data only in the living room. But another of those confounded laws predicts that a day will come when you need to plug in a printer, or a modem, or a second disk drive, or a . . . well, you get the picture. Be a good Scout, and start out being prepared.

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little electrical exploring or have someone knowledgeable do it for you. A 20-amp circuit breaker is usually enough to handle a Mac, a printer, and the normal paraphernalia that go with it. But in my office, I also have a television, a copier, a postage machine, a stereo, a fax, a phone system, and heaven knows what else (there seem to be power cables going places I haven't been able to trace). A single circuit can't handle them all, nor can a smaller-capacity circuit handle my Mac equipment alone. Older buildings are especially prone to capacity problems, whereas newer ones (say, post-'60s), if built to code, simply throw a circuit breaker if you exceed the limit. And remember that extension cords — and the cable feeding the power strip — should always be at least as thick as the thickest cable they connect to, or you might create a fire hazard.

I use a Kensington MasterPiece Mac II to handle surge protection and many of the electrical plug-ins. This unit sits underneath my monitor and provides front-panel switches for four devices (above and beyond the Mac itself) as well as a master switch. Unfortunately, my needs run well beyond what the MasterPiece can handle and I've yet to see a similar unit that can handle those little black transformer boxes that seem to come with all modems and phone equipment (the boxes are too big and overlap into the next plug, they're too heavy to sit vertically, and some of them are just far too big to sit anywhere but on the floor).

I solve the first problem by having other power strips for other systems (all the phone equipment is plugged in to one, for example), and I solve the second problem by using extension cords to connect those boxy transformers and the socket in the power strip. If your setup is simpler than mine (a hard-disk drive, a monitor, a printer, and a modem, say), I heartily recommend the Kensington unit. If you're like me, with a lot more, the MasterPiece is still handy but it's not as much of a problem solver. It *is* nice to be able to turn off the printer when I'm not using it (the NEC SilentWriter I own is anything but), but other than that, I usually leave everything powered on all the time.

Fine, power isn't a problem, you say. Let's get those boxes onto the desktop and start working.

Hold on. Let's think about this for a minute. First, where you position the monitor is important. The experts say that

If you really believe your monitor is going to kill you, sell your current Mac and buy a Portable or an Outbound, neither of which has any of the "offending" emissions.

it should be slightly lower than your line of vision when you're sitting down. Unfortunately, tilting the monitor up means that overhead lighting is reflected on the screen, creating terrible glare. Furthermore, I argue that you should never set your monitor against a wall, and it shouldn't be against a window or right next to one (outside light is too much of a contrast against the relatively dim monitor, and you're more likely to get bad glare the closer the monitor is to a window).

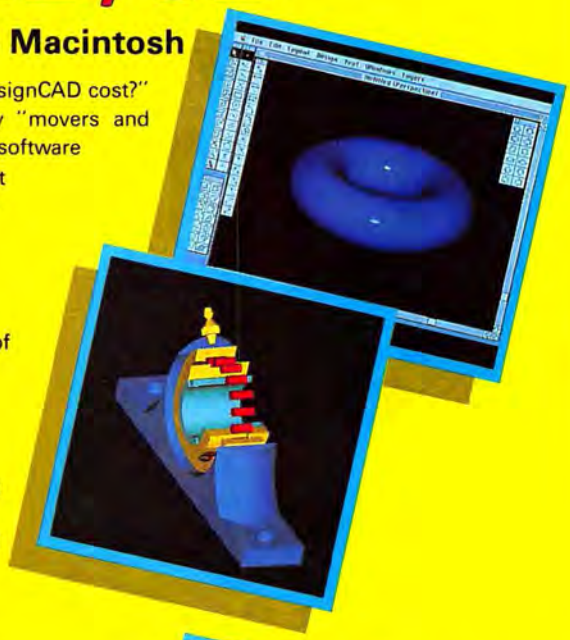
The reason you shouldn't set your monitor against a wall is simple: You have nowhere to look when you're not looking at your monitor. Eyes are meant to shift focus — if you keep your focus depth at a single plane, your eye muscles will eventually get tired of holding that position and you'll end up with headaches. I have my desk positioned in the middle of my office, with my chair facing the door. The monitor is at the back of the desk, but it's another four feet to the nearest wall. I can look up at that wall or over to (and through) the door or turn to my right and look out the window at the Pacific (well, assuming there isn't any fog, which is not a safe assumption where I live). My eyes get plenty of focus change during the day, and I've never had the tired-eyes syndrome others complain about since I adopted this setup.

There's also been much brouhaha lately about just what a color monitor does to your body. Those mysterious EFI radiations and such are being blamed for everything from birth defects to lack of sex drive. For the farsighted among you, the good news is that the farther away from the monitor you are, the less dosage of anything you're receiving (with Apple's 13-inch RGB monitor, the usual suggestion is to be at least 28 inches away — monochrome monitors aren't as bad; also, the highest emissions from most color monitors come from the side and back, so don't set your chair next to someone

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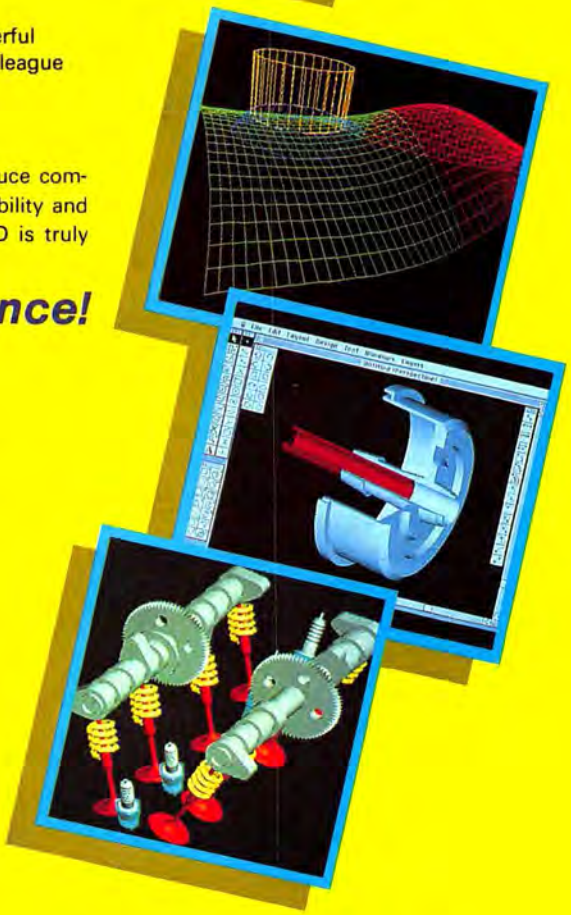
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else's monitor!). The bad news is that no one knows exactly what damage the monitor might be doing and that the rest of your equipment might be doing as much or more.

I'm rather nonchalant about all the claims of potential problems. As a writer, I'd much rather be working with the equipment I have now than what I used before. I've been using my present kind of setup for 14 years, so if there is an effect, I'm already well on the path to discovering it. But I also realize that the human body is remarkably adept at adapting to changing environments. Frankly, the notion of potential risk that is being bandied about is probably lower than the risk I'd have if I drove to work every day. If I'm going to worry about things that might affect my health, air pollution, toxic-waste disposal, and the depletion of the ozone layer seem to pose far greater threats and those are the areas on which I'll center my worries. It's also nice to know that the computer industry, although certainly no saint, does have a record of trying to deal with its health and waste problems. I believe Apple is sincere when it claims that it's looking closely at ways to reduce all emissions from its equipment and is attempting to monitor whether those emissions pose any potential health hazards.

Of course, I live within a few feet of one of the world's most active and violent earthquake faults, so who am I to talk about risk? If you really believe your monitor is going to kill you, sell your current Mac and buy a Portable or an Outbound, neither of which has any of the "offending" emissions.

But I'm straying from the subject at hand. Let's get back to setting up your computer. As far as the monitor is concerned, an antiglare screen may help in some situations (although the temptation is to boost the brightness and contrast levels to compensate for it, which is partly self-defeating, because you'll end up with a washed-out picture). A better solution is often simply to have a large piece of cardboard sticking out from the top of the screen to cut off the overhead light that would otherwise fall on the display area (kind of like a baseball cap for your monitor). Screens that claim to lower radiation levels are as yet unproven (the claims are merely claims — no agency or unbiased group monitors them, nor is there any scientific proof that they can cut down emissions), but they may lower your personal panic level. I use neither type of screen, counting on good setup to keep glare off the monitor. (Hint: Get rid of overhead fluorescents, and use desk lamps.)

Two things about cables you need to know: You'll never get them exactly right, and you'll need access to them five times more often than in your wildest dreams.

I also don't subscribe much to the theory that all your computer equipment needs to be right up there on the desk with the monitor and keyboard. My Mac II and its host of disk drives (six at last count) sit on a box on the floor to the right of my chair. If I need to insert a floppy or Bernoulli cartridge, I just let my right hand fall to my side and insert away. In other words, the machine is still close at hand but it isn't taking up precious desk space.

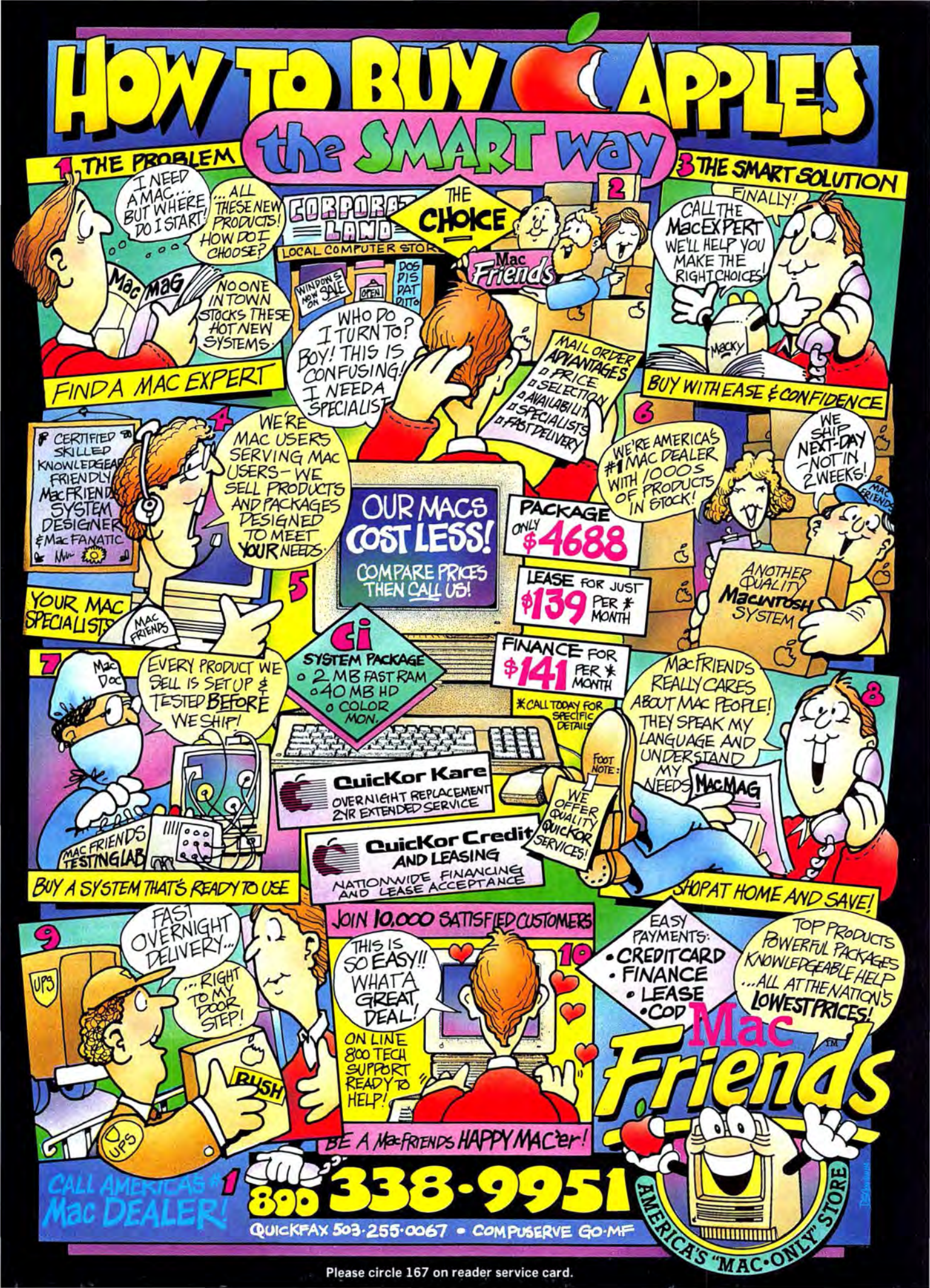
As for the controversy surrounding whether or not you can safely turn a Mac II on its side, the problem lies with the disk drive. If you're going to verticalize your Mac II, do the following:

1. Perform a low-level format on the drive in the position you will use it in.

2. Don't keep changing the orientation — once vertical, always vertical; once horizontal, always horizontal.

3. Pay careful attention to air flow, especially with the Mac II, IIx, and IIfx, which aren't designed to sit on their sides. If you want to put one of these models on its side, you'd better get a special stand for it. The IIcx and IIci, on the other hand, were designed to go either way.

I've positioned my printer at my back (my equipment thus forms a crude semicircle around me — nothing too far away but nothing dominating my work space either). I kind of enjoy moving over to the printer to get my output — it gives me a reason to get out of the chair (or at least scoot it around on the floor) every once in a while. As with my monitor, I've positioned my printer to give my life in the office a little variety — I don't want to be sitting in one spot looking in one direction all day. The more you use your computer, the more you should pay attention to these small elements of life with a Mac. If you use your computer for



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only ten minutes a day (why are you reading *MacUser?*), fine, put it anywhere — ergonomics and comfort of use mean nothing to you, because you aren't at the computer long enough to get a stiff back, sore eyes, and a bored mind.

Now you've decided where everything goes, the tough part comes into play: putting it there and hooking it up. Cables are the bane of every computer user's existence. There are cables for everything. The back of my Mac II sports 16 cables in its minimum configuration (just imagine how many there are when I hook up my MIDI keyboard and video equipment). I've even gotten to the point where I have so many serial devices that I had to install a switch box!

Two things about cables you need to know: You'll never get them exactly right or permanently installed, and you'll need access to them five times more often than in your wildest dreams. Thus, Thom's First Rule of Cables: All cables should be accessible within seconds. This means that no equipment should be pushed up against a wall unless (1) its cables plug into the front (Fat chance! Not a single piece of equipment in my office manages this.), (2) you have a way to quickly slide the equipment away from the wall (rollers are nice), or (3) you're a masochist.

Accessibility is even more important because of my Second Rule: All cables should be locked in position, where possible. Most Apple cables have screw locks to hold them in place. SCSI cables have little wire bars that you slide over metal flanges. Cables are easy to snag and pull on, and if the cable isn't secured, Murphy's Law predicts, even the lightest pull will dislodge the cable enough so that it no longer makes a connection or, worse still, makes an intermittent connection. (And if you put the computer against a wall, guess what you're going to have to move to check the connections? See above.)

I also suggest that you label every cable. Get some white plastic tape, cut off a 2-inch piece, wrap it around the cable once, and stick the ends together to make a little flag. Do this at both ends of the cable. Write the type of connection on these flags — for example, you could write "Modem @ Mac" on the connector of the modem cable that plugs into the Mac and you could write "Modem @ Modem" at the other end. If you take the time to perform this little labeling operation, you'll be much happier the day your child crawls behind your computer and starts pulling on things (you did lock those cables down, didn't you?).

In summary, setting up a computer involves (1) scoping out the equipment locations for comfort and convenience, (2) placing the equipment, and (3) running and securing the cables.

Using It

Fine. So you're sitting there using your computer, and your back still aches and your wrists feel like they've been gripped by a python. Posture, of course, plays a part here (I'm really bad on this count — the second-worst sloucher I know). But



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your body is also telling you something.

I used to get lower-back pains and aching hands when I worked at the computer for a full day. Then I started experimenting. First, I installed my keyboard in an underdesk drawer. Not only does this get it out of the way when I'm not typing, but also it lowers my hands several inches while I'm typing. The aching wrists went away, although I feel I should lower the keyboard a bit more still to stop me from hunching. In fact, I sometimes take the keyboard out and set it on my lap, and that feels like the most comfortable position yet — a little inconvenient, perhaps, but comfortable. Fortunately, the Mac is better-suited to your moving the keyboard about than are most computers (whoever decided that keyboards had to be plugged into the *back* of machines?).

Still my lower back was bothering me. I began to suspect the mouse. Because you need a flat surface to mouse around on, the temptation is to use it on your desktop. But I moved the keyboard from there because it was too high (I suppose if you're 6 foot 4, you're not buying any of this, but we average-height folks have to reach up to the desktop). Not only was I reaching up to use the mouse but I was also reaching forward and, because I use the mouse with only one hand, sort of lurching to the right. Definitely not the kind of gymnastics I want to go through eight hours a day.

About the time I was pondering this problem, my significant other bought a car cover. She was busy with other things at the time, so she didn't unpack it right away. I noticed that the box the car cover was in was about the same height as my lap. So first it became an end table in the living room. Being the quick thinker I am, a couple of months went by before I had the next brainstorm. Hmmm. Maybe if I set this box to the right of my desk chair and put my mouse on it, I wouldn't have to lunge forward to use the little creature. Suffice it to say that in the next few months the car cover, still in its box, did double-duty as a mouse rest. Eventually my partner sought out the car cover, which provoked me into doing something permanent. Now to the right of my chair, at about lap height, you'll find a MicroSpeed MacTrac trackball in place of the mouse. I figured the less back and forth movement I made the better, although in reality this hasn't resulted in any spectacular muscle relaxing.

The moral of these stories is simple: If you're uncomfortable using your Mac, there's a reason. Find it. Eliminate the problem. Common sense is usually all it takes, although having a second party look at your setup sometimes helps find things you've overlooked. Remember, the Macintosh should be a fun machine to use, so don't ruin that fun by shoving it into any old corner.

Thom Hogan is the president of Macreations Publishing Corp., the creator of Tycho Table Maker. His most recent book is *Programmer's Apple Mac Sourcebook*, published by Microsoft Press.

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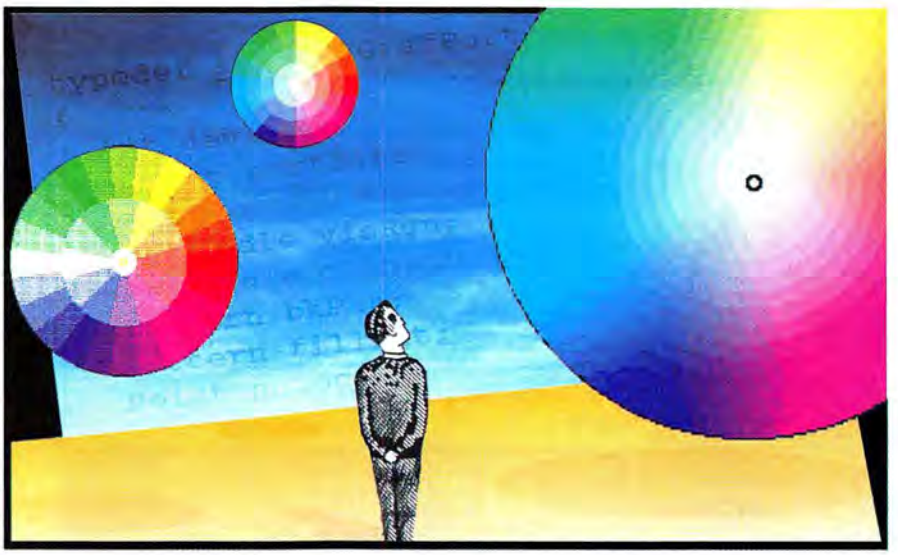
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Local Color

During this colorful time of year, we can't resist taking a side road to explore how the Mac supports color output. For those of you following Browser, remember that all things come to those who wait — we'll be back in January with the final installment.

By Kurt W. G. Matthies and Thom Hogan



The `GrafPort` data structure (see Example 1), which provides the foundation for all drawing on a Mac, has supported color — the infamous eight original colors: black, white, red, green, blue, magenta, cyan, and yellow — since its inception. Unfortunately, early Macs provided no way to display anything but black and white. Once IBM had delivered its EGA, Mac bashing flourished (with our own anti-editor, John C. Dvorak, as gang leader), with the most vocal complaint being about the lack of color.

With the introduction of the ImageWriter II printer, Apple made an attempt at color output (how many of you remember buying those fat tricolor ribbons at the January 1987 Mac Expo?), but the idea never really caught on among developers and few programs supported this output method (Silicon Beach's SuperPaint was probably the best of the bunch). Color didn't become a viable alternative on the Mac until the advent of Color QuickDraw on the Mac II.

Color Me QuickDraw

Color QuickDraw, introduced with System 5 and described in *Inside Macintosh, Volume V,* provides a wealth of color-supporting utilities. Color QuickDraw is built in to the ROMs of all Mac II models and the Mac SE/30. The new foundation of drawing is the `CGrafPort` (see Example 2), where the *C* stands for full RGB color.

The `CGrafPort` structure is based on the `GrafPort` structure and is conveniently the same size, which means that the window structure doesn't have to change size to support color (remember that a `WindowRecord` contains a `GrafPort` as its first element). But if you look at the side-by-side Examples 1 and 2, you'll see that some of the fields have changed in both name and type whereas others have remained the same. These changes are, of course, because of the addition of RGB color, and they're guaranteed to cause grief for those who don't pay attention to the machine the program is running on (we'll cover how to handle that at the end of this month's installment).

Bit-Mapped Displays

Before you can understand how to manipulate color, you must have a solid understanding of how the Mac creates a display in monochrome. The most startling difference between the Macintosh and its predecessors is the seamless mixture of text and graphics on the screen, a by-product of the machine's bit-mapped display. On a monochrome Mac, every pixel on the screen is controlled by the value of a single bit in video RAM. If the bit's value is 0, then the corresponding pixel displays white; otherwise, the pixel displays black.

This mapping of the screen's illumination to a data structure in RAM is the fundamental principle of bit-mapped graphics. On a monochrome Mac, this data is contained in a `BitMap` structure, an integral part of the `GrafPort`.

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A pointer to the port's bit-map buffer is kept in the **baseAddr** field of the **BitMap** structure (see Example 3). It's common in the monochrome world for an application to write directly into this buffer to form an image — in the rotation of an on-screen object, for example.

The **rowBytes** field gives dimension to the buffer. It is a modulus that tells you where one row ends and the next begins within the buffer. On a 512-x-350-pixel screen, **rowBytes** equals 64, which means that every 64 bytes into the buffer, a new row of data starts. (You can figure this out by dividing the horizontal resolution by 8, the number of bits in a byte.) With a small amount of pointer arithmetic, you can easily point to the beginning of a particular row in a **BitMap** structure, as demonstrated in Example 4.

The **bounds** field of the structure is an extent rectangle that defines the pixel size of the **BitMap**. As an example of using this extent, consider the global variable **screenBits**, which holds the **BitMap** structure of the main graphics device. On a Macintosh Plus or on an SE without an external monitor, this corresponds to the Mac's original 512-x-350-pixel screen. Apple used to recommend

Example 1

```
typedef struct GrafPort
{
    int device;
    BitMap portBits;
    Rect portRect;
    RgnHandle visRgn;
    RgnHandle clipRgn;
    Pattern bkPat;
    Pattern fillPat;
    Point pnLoc;
    Point pnSize;
    int pnMode;
    Pattern pnPat;
    int pnVis;
    int txFont;
    Style txFace;
    int txMode;
    int txSize;
    Fixed spExtra;
    long fgColor;
    long bkColor;
    int colrBit;
    int patStretch;
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    Handle rgnSave;
    Handle polySave;
    QDProcsPtr grafProcs;
};
```

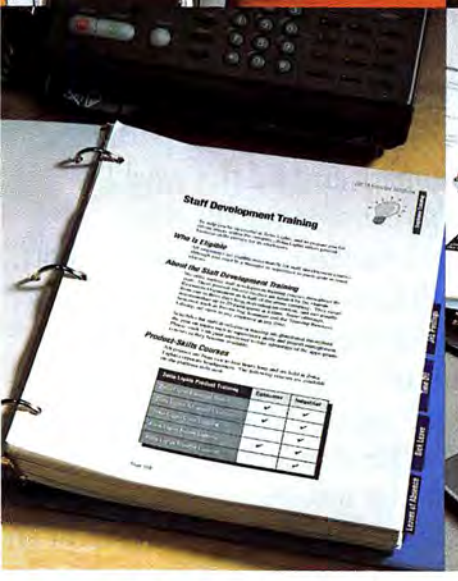
The **GrafPort** data structure

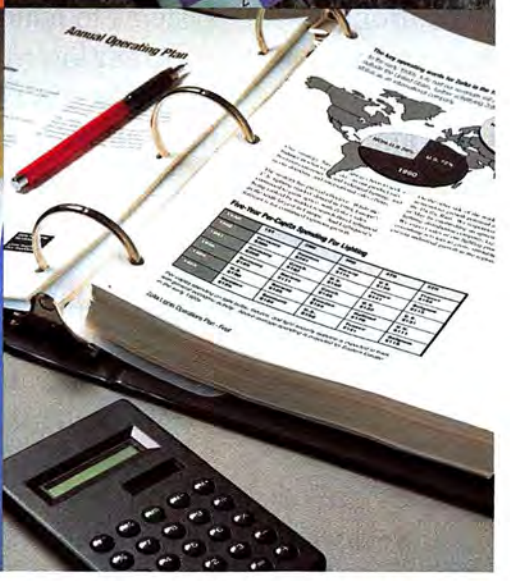


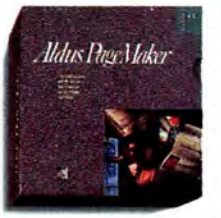












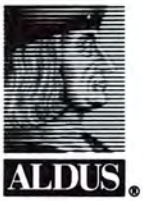
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`BitMap`, with its miserly 1 bit per pixel, can contain the data for only two colors: black and white. Enter `PixMap`.

that you get the screen size by looking at this variable. The code in Example 5 demonstrates the process.

Now that we've gone ahead and mentioned the old method, you should know that in these days of multiple monitors, `screenBits` is no longer adequate. `GetGrayRgn`, an addition to the Toolbox that is coincident with Color QuickDraw, returns a handle to the *gray region*, which describes the entire screen area that's available to your application. If you're trying to keep your Mac application state-of-the-art, you must use `GetGrayRgn` to determine the screen region. The new method is demonstrated in Example 6.

Example 2

```
typedef struct CGrafPort
{
  int device;
  PixMapHandle portPixMap;
  int portVersion;
  Handle grafVars;
  int chExtra;
  int pnLocFrac;

  Rect portRect;
  RgnHandle visRgn;
  RgnHandle clipRgn;

  PixPatHandle bkPixPat;
  RGBColor rgbFgColor;
  RGBColor rgbBkColor;

  Point pnLoc;
  Point pnSize;
  int pnMode;

  PixPatHandle pnPixPat;
  PixPatHandle fillPixPat;

  int pnVis;
  int txFont;
  Style txFace;
  int txMode;
  int txSize;
  Fixed spExtra;
  long fgColor;
  long bkColor;
  int colrBit;
  int patStretch;
  Handle picSave;
  Handle rgnSave;
  Handle polySave;

  CQDProcsPtr grafProcs;
};
```

The `CGrafPort` data structure

`BitMap` contains a minimum of data — only the on/off state of its pixels. This minimum information is known as 1-bit-per-pixel video.

(How much memory is needed to store all the pixels on your screen? Given that a Mac SE screen has a resolution of 512 x 350 pixels, there are 512 rows, divided by 8 bits per byte, times the 350 rows required to store the screen, which our calculator reports to be 22,400 bytes. Is it any wonder that 128K Macintoshes used monochrome displays, with roughly 20 percent of available RAM allocated to the screen?)

Color and the Powers of 2

To store color information, you need more than one bit of information per pixel. One bit of information has only two possible states — on or off. Two bits of information have four possible states, three bits have eight possible states, and so on. States translate into colors — the number of bits of information you keep per pixel defines the number of colors available for screen display. This range is expressed as 2^n, where n is the bits-per-pixel value.

The standard Apple color card for the Macintosh II supports 8 bits per pixel. Because 2^8 is 256, this device can display no more than 256 colors simultaneously. Higher-priced video cards, which contain up to 24 bits per pixel of color information, can support 224 bits per pixel, or more than 16 million simultaneous colors. The key word here is simultaneous — although the video device can display millions of possible colors, the 2^n value defines how many colors can be displayed at one time.

RGB Color

As we mentioned earlier, Color QuickDraw supports RGB color. The RGB system specifies a color in terms of three components — a red value, a blue value, and a green value — which correspond to the three guns that generate an image on a color video monitor. Apple has defined a data structure, `RGBColor`, presented here in Example 7, to hold color values.

Each component of the `RGBColor`



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Example 3

```
typedef  struct BitMap
{
  Ptr    baseAddr;
  short  rowBytes;
  Rect   bounds;
} BitMap;
```

The `BitMap` data structure

Example 4

```
Ptr
findBMRow (int row, BitMap *bp)
{
   /*
      point to the row of interest
      Note: needs bounds checking of row!
   */
   return (bp->baseAddr + ((row - 1) * bp->rowBytes));
}
```

Returning a pointer to a particular row in a `BitMap` structure

Example 5

```
int resH, resV;

resH = screenBits.bounds.right - screenBits.bounds.left;
resV = screenBits.bounds.bottom - screenBits.bounds.top;
```

The old method of getting the screen size

Example 6

```
RgnHandle grayRgn;
register Rect *grayRectPtr;

grayRgn = GetGrayRgn();
grayRectPtr = &(*grayRgn)->rgnBBox;
resH = grayRectPtr->right - grayRectPtr->left;
resV = grayRectPtr->bounds.bottom - grayRectPtr->top;
```

The preferred method of getting the screen region

structure can have a value within the range `0x0000` to `0xFFFF`. Colors, therefore, are expressed as three values, with black being at `(0x0000, 0x0000, 0x0000)` and white being at `(0xFFFF, 0xFFFF, 0xFFFF)`. Shades of gray are expressed as equal values of each component, as in medium gray `(0x8000, 0x8000, 0x8000)`. Primary colors are the result of using a nonzero value in a single component, as in blue `(0x0000, 0x0000, 0xF000)`. Secondary colors come from blending, as in yellow, which is part red and part green `(0xFFFF, 0xFFFF, 0x0000)`, or violet, which is made from red and blue `(0x8000, 0x0000, 0xF000)`.

Color Tables

Colors are specified as 24-bit quantities, but the available memory on video cards for most Macs limits the screen display to 8-bit-color information. These video cards have a standard 640-x-480-



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pixel resolution. With 1 bit of information per pixel, this resolution translates into 307,200 pixels, or 38,400 bytes. But if you kept a 24-bit RGB value for each pixel, then the video device would require close to a megabyte of RAM.

To optimize memory usage, 8-bit video cards use a color-lookup table, which works as follows. Every color value is kept in a table (which has a maximum size of 256 colors). Instead of the 24-bit-color value for each pixel being stored, what is saved in the pixel map is an 8-bit index to one of these values. The color table is maintained dynamically by the Color Manager, which is responsible for mapping the pixels' color indexes into the actual 24-bit values. Although this happens below your level of consciousness in Color QuickDraw, you need an awareness of color indexes to know how a **PixMap** structure maintains color data.

The PixMap Structure

BitMap, with its miserly 1 bit per pixel, can contain the data for only two colors: black and white. Enter **PixMap**, the data structure that breaks the 1-bit-per-pixel barrier. The **PixMap** structure is defined in Example 8. Note that **PixMap** contains **BitMap** — the structure that maintains **baseAddr**, **rowBytes**, and **bounds** fields — but that new fields have been added at the end to support color.

PixMap can be passed to **CopyBits**, the Toolbox routine that duplicates a **BitMap**, and **CopyBits** is integral to the operations of the Menu Manager, Window Manager, and other fundamental managers. It was for this reason that Apple designers chose to keep the **BitMap** part of **PixMap** (the first three members) intact. The **PixMap** structure is also flexible enough to accommodate many variations in hardware and to support multiple monitors.

For our purposes in manipulating colors, the most important data maintained by **PixMap** is the number of bits per pixel, also called the *pixel depth* of **PixMap**, which is kept in the **pixelSize** field. Remember that the pixel depth determines how many simultaneous colors you can have in the **PixMap** structure.

Chunky and Planar Pixels

Another important factor is the arrangement of the data, referred to as the packing type, in the **BitMap** part.

Example 7

```
typedef struct RGBColor
{
   unsigned short red,
                  green,
                  blue;
} RGBColor;
```

The RGBColor data structure

Example 8

```
typedef struct PixMap
{
   Ptr    baseAddr;
   short  rowBytes;
   Rect   bounds;
   short  pmVersion,
          packType;
   long   packSize;
   Fixed  hRes,
          vRes;
   short  pixelType,
          pixelSize,
          cmpCount
          cmpSize;
   CTabHandle pmTable;
   long    pmReserved;
}  PixMap, *PixMapPtr,
 **PixMapHandle;
```

The PixMap data structure

Example 9

```
SysEnvRec gSysEnv;

/* getting the
   SysEnvirons data */
SysEnvirons (&gSysEnv);
...


/* when you create a
   window */
...
if (gSysEnv.hasColorQD)
   winPtr=NewCWindow(...
else
   winPtr=NewWindow(...
```

Detecting the presence of Color QuickDraw

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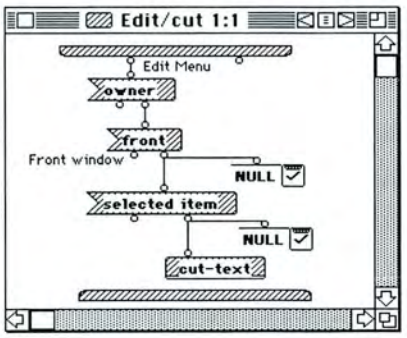
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To draw in color, you first need to create a color window, but the one thing you don't want your application to do is create a color window on a monochrome machine.

`PixMap` supports two basic kinds of packing: *chunky* and *planar*. With chunky packing, the color index for each pixel is stored in sequential bits of the `PixMap` structure's buffer, so the offset from one pixel to the next in the buffer depends on the pixel depth. With 8-bit-per-pixel color, neighboring pixels are exactly 1 byte away from each other. In a 4-bit-per-pixel `PixMap`, each pixel is 4 bits away from the next.

Planar `PixMap` structures are organized like multiple layered `BitMap` structures are — adjacent pixels are next to each other, as they are in a one-pixel-deep `BitMap`. The difference is that a `PixMap` has multiple *bit planes*, which must be taken together to get a pixel's color index. These planes can be viewed as separate buffers that map the entire screen but contain only one pixel of color information. The entire color-index value for a pixel is derived from a *z*-dimension sortie into all the planes, followed by a calculation that weights the value found in each plane.

Many graphics devices, such as those produced by Tektronix, are based on the planar model. Generally speaking, though, most current color-display technology uses chunky addressing rather than planar.

Color Windows

With the background out of the way, it's time to do some drawing. Most applications do not write directly to the `PixMap`; rather, they modify it by drawing in the window. This is where Apple has made it easy. You create color windows with `NewCWindow`, which is the Color QuickDraw version of the `NewWindow` routine. Once you've created a window, you're ready to draw in color.

Because the `WindowRecord` structure is fundamental to the document structure of many applications, Apple decided that it wouldn't modify it. (The `CWindowRecord`, which contains a `CGrafPort` instead of a `GrafPort`, is otherwise identical to `WindowRecord`.) Instead, the Window Manager maintains an *auxiliary window record* for color windows to contain the color information. As you create colors with Color QuickDraw, this auxiliary window record is updated with the new values.

Apple has also modified all the standard QuickDraw drawing procedures to enable them to accommodate color. The graphics verbs *draw*, *invert*, *paint*, and *frame* (as in `DrawLine`, `InvertArc`, `PaintRect`, and `FrameRect`) employ the window's `CGrafPort` foreground and background colors, which are specified with `RGBForeColor` and `RGBBackColor`.

Detecting Color

To draw in color, you first need to create a color window, but the one thing you don't want your application to do is create a color window on a monochrome machine. If you ignore this basic step, your application will be treated to a bomb box the first time that you try to run it. `SysEnvirons` is the call that reports the presence of Color QuickDraw. To test for color, you must check the value of the `hasColorQD` member of the `SysEnvirons` structure. If this value is nonzero, call `NewCWindow`; otherwise, call the old standby `NewWindow`. Example 9 demonstrates the color-detection procedure.

Color is a vast subject to tackle in detail. In this installment, we believe that we've gotten you to the point at which you can start writing to the display in a colorful manner. If you take some time to peruse the relevant sections of *Inside Macintosh, Volume V*, you'll find that there are color patterns, color icons, and even color fonts to play with. Another novelty is the Palette Manager, which supports collections of colors, known as palettes, and removes you from the gory details of machine configuration in a MultiFinder-controlled world. Finally, there's the Color Picker package, which is the standard Apple interface for selecting an RGB value. We'll certainly have more to say on this subject in future columns, but for now, all we have room for is to wish you a colorful holiday season.

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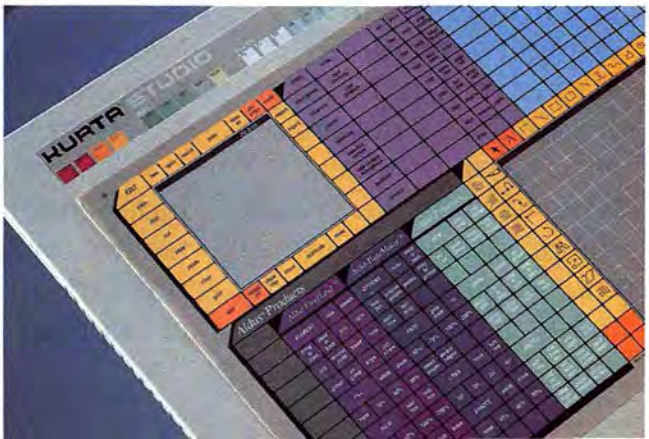
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MacUSER LABS
NETWORKSHOP

MACUSER LABS ANNOUNCES THE OPENING OF ITS NETWORKSHOP



Today the Macintosh is no longer a stand-alone computer. Macs are found in every type of department and every type of business. And they are not just running DTP applications. Spreadsheets, word processing, accounting packages, engineering applications, multi-media – Macs are running whatever business needs. They are interfaced with IBM mainframes, VAXes, Sun and other UNIX work-stations, and MS-DOS personal computers.

They're doing all this now and will be doing it even more extensively in the future.

Business buyers of Macintosh products have to know how well the products they are considering perform in these challenging environments.

That's why MacUser, the leader in providing brand specifiers objective, thorough and reliable information, announces the opening of the NetWorkShop, a major new extension of its MacUser Labs.

The only independent testing facility for Macintosh products intended for networked systems.

THE PREMIER TESTING FACILITY FOR MACINTOSH IN THE 90'S

From the moment plans were begun to the time the last wires were punched down, no expense was spared to ensure that MacUser would develop the industry's most authentic workgroup environment dedicated entirely to connectivity, networking and productivity issues. As different platforms and new technologies proliferate, the NetWorkShop will emerge as an indispensable information resource for Macintosh business buyers and vendors.

AN UNPARALLELED INSTALLATION MacUser Labs' NetWorkShop is a one-of-a kind facility with the capacity to hold 60 CPUs plus monitors and printers. It has custom-designed racks connecting all the CPUs to a patch panel where any CPU can be connected to LocalTalk, Ethernet or Token Ring. On site are over 30 Mac's of all kinds, a NeXT workstation, a Sun SPARCstation, two micro VAXes, and four IBM compatibles; Novell NetWare and 3COM 3+0 Open File Servers, and a variety of routers and gateways. It incorporates the major operating systems including UNIX, VMS, DOS, OS/2 Windows, and Mac OS. Products to be tested include big servers, 10BASE-T Ethernet cards and concentrators, multiuser databases, routers and gateways, network management products, Mac as a workstation, terminal emulation software, multi-platform and multi-protocol integration, and any Macintosh product capable of operating in a networked environment.



A STAFF OF EXPERTS Headed by Technical Director Henry Bortman and Labs Director Andrew Eisner, the staff of the NetWorkShop represents a remarkable 40+ years of experience in a field just over five years old. Each lab member has a recognized standing in the Mac industry. Together they form a highly coordinated team with an unassailable reputation for integrity.

REAL WORLD TESTING No ivory-tower analysis can provide meaningful information to serious buyers. MacUser Labs' NetWorkShop has been designed to simulate conditions likely to be encountered in any modern business environment. The staff contacts vendors and buyers to pinpoint the technical issues and characteristics that distinguish the products, then develops test



scripts with the goal of asking the right questions and finding the answers.

SURVIVAL INFORMATION FOR DEALING WITH THE 90'S The real art of lab testing is interpreting data – distilling it into critical information buyers can use to make intelligent purchase decisions. We analyze the data, interpret it, then write insightful recommendations that buyers must have to make product choices appropriate to their specific business requirements.

The value of MacUser Labs' findings is measured by the vast sums that companies are ready to commit, now and in the future.



Sums that are always significant and often awesome. MacUser Labs reports save buyers time, money, and take the risk out of their recommendations. Just as any serious buyer needs the information we provide, any serious marketer needs to know how his product performs in these demanding situations.

MACUSER-PREFERRED FOR INFORMATION MacUser Labs' NetWorkShop is yet another example of the many invaluable services on which MacUser has built its reputation in this highly important, rapidly growing industry.

The NetWorkShop employs the same high standards of accuracy, reliability and pertinence that has gained MacUser its remarkable degree of influence among today's Macintosh Brand Specifiers.

Month after month, MacUser produces noticeable, quality results. In testing. In reporting. In its unrivalled combination of editorial and readership. MacUser is simply the best information resource for Macintosh products.

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Do you have an undocumented Macintosh tip you're willing to share? MacUser *pays at least $25 for every tip used, and the Tip of the Month earns $100.*

✉ *Send your tip, together with your name, address, and phone number, to Tip Sheet, c/o* MacUser, *950 Tower Lane, 18th Floor, Foster City, CA 94404.*

You can also contribute tips electronically, via Zmac, the on-line service for MacUser. *Send your tips to Gregory Wasson at 72511,36. Be sure to include your full name and mailing address along with the text of the tip.*

Compiled by Gregory Wasson

PageMaker 4.0

In converting our company's catalog text from MacWrite II to PageMaker 4.0, we discovered that the importation and creation of en dashes is inconsistent.

Our document contained many en and em dashes. Although we had no trouble importing em dashes (Shift-Option-hyphen) in either the page-layout or the story-editor view, en dashes (Option-hyphen) didn't survive the Place or Import procedures.

In the story editor, you can't import en dashes, nor can you create them. The mode's global-change option doesn't recognize them. They import as hyphens.

When you use the Place command on imported text in the page-layout view, the en dashes change to hyphens. You can create en dashes in the page-layout view with the standard Option-hyphen keystroke combination, however.

There is a way around this shortcoming: Cut and paste between applications. Copy the text you want to import from your word-processing file, and then close the document. Open the PageMaker 4.0 file, and paste the text.

Although more steps are involved in this technique, if you have many en dashes in an existing document and want to copy directly to the PageMaker document, this is the only way the en dashes will survive the transition.

Sandra Richardson
Burlingame, CA



Figure 1: It's a cinch in FreeHand, but do you know how to create this popular reversed-type effect in Illustrator 88?

Adobe Illustrator 88

The effect shown in Figure 1 is a popular and effective one for logos and mastheads. It's simple to create it in FreeHand, using the Clone and Paste Inside functions. Here's an easy way to get the same effect while using Adobe's Illustrator 88:

1. Ungroup the circle or geometric shape you've drawn (Command-U). Paint it black, and choose the Mask option.

2. Paint the text white, and bring it to the front. Copy the text to another part of the page with an Option-drag.

3. Group the circle and the first text. Now drag the second text precisely over the top of the first. Paint it black, and send it to the back.

Tip of the Month

PageMaker 4.0

Have you wished for a way to group items in PageMaker 4.0? Here's a simple way to do it:

1. Select and copy the items you want to group, and then paste them (all at once) into the Scrapbook.

2. Now place (Command-D) the Scrapbook file (Hint: It's in your System Folder). You can now resize the whole "group" (see Figure 2).

To ungroup the items, open the Scrapbook in the regular way through the Apple menu and then copy and paste the selection into a PageMaker document. You'll once again be able to edit the separate items.

Kevin McDaniel
Rancho Santa Margarita, CA

[*Using the Scrapbook file as a convenient place to store graphics or text files can help you get different files into your PageMaker document more efficiently — especially if you're trying to save memory by not running under MultiFinder. When you place the Scrapbook file, PageMaker selects every item in the Scrapbook in turn, pausing after each one to let you determine where you want to put the next one. — Ed.*]

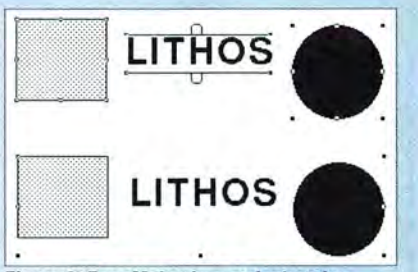


Figure 2: PageMaker has no feature for grouping objects such as these, but you can use the Scrapbook to get the same effect.

The white text masks the circle, and the black text underneath shows only on the outside of the circle.

Kevin Cross
Alexandria, VA

Capture

Whenever you need a thumbnail of some pages, don't bother using your page-layout program's Thumbnail print option, because it takes too long to print (especially if the pages consist of halftones and fonts that have to be downloaded and scaled).

Instead, use a screen-capture utility such as Capture to take a picture of the pages one at a time. Paste them into the Scrapbook or directly into another document, reducing the "thumbnails" so that several can fit on a page (see Figure 3).

Although the quality of thumbnails created in this way won't be as good as that of those generated from within page-layout programs, it will be good enough for examining the general look of a page or document. This method has several advantages:

1. You can choose the exact thumbnail size you want — something you can't do with the Thumbnail print option in your page-layout program.

2. You can add descriptive copy.

3. Printing is much faster because you're only dealing with a single bit map per page.

Saul Adler
Bronx, NY

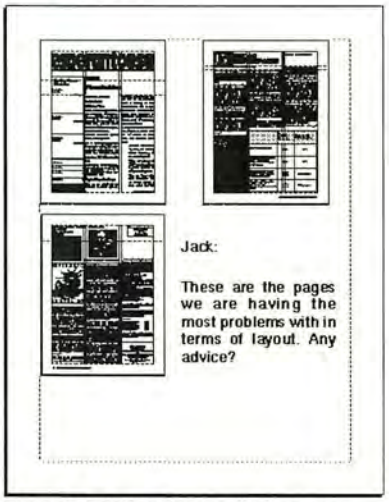


Figure 3: Printing thumbnails from page-layout programs is fast and flexible if you use a screen-capture utility such as Capture.

Worksheet1

	A	B	C	D	E	F
1	LNAME	FNAME	ADDRESS	CITY	STATE	ZIP
2	Smith	John	552 West Drive	Santa Cruz	CA	95060
3	Doe	Mary	82 Oak Street	Felton	CA	95018
4	Johnson	Michael	902 Locust Ave.	Capitola	CA	95063
5						
6						
7						

Figure 4: Excel provides a friendly interface for creating an address-book database you can use in Word 4.0 mail-merge letters.

Excel 2.2

I need to print form letters but have always felt intimidated by Word 4.0's mail-merge features. The manual has more than 20 pages of notes and options, which can be confusing. But one of Microsoft's other products, Excel, has come to the rescue, simplifying the mail-merge process for me and providing a simple flat-file database as well.

Here's how to set things up:

1. Create an Excel address database as shown in Figure 4. You can sort, print, edit, or search it. Make sure you save a version in the CSV (Comma Separated Values) text format so Word will be able to access it.

2. Set up a Word "main document" (see pages 69 to 72 in the Word 4.0 manual) — not a difficult process. The first line contains the DATA statement followed by the name of the "data document," or address database. Text prints as usual. Field names are enclosed in double angle brackets («» — Option-\, Shift-Option-\). See the example in Figure 5.

3. Now here's the good part. See all those field names? They're common to both the Excel address database and the Word main document (the form letter). Just make sure the name you use in the Word form letter is the same as the name you've given the Excel file saved in the CSV text format.

To print form letters, open your main document in Word, select Print Merge, and choose which records (the row numbers in your Excel address database that contain the names and addresses you want) to print. Click on the Print button, and you've finished.

Gerald T. O'Neill
Davis, CA

«DATA address»¶
Thursday, August 16, 1990¶
¶
«FNAME» «LNAME»¶
«ADDRESS»¶
«CITY», «STATE» «ZIP»¶
¶
Dear «FNAME»,¶
¶
[Insert form letter text here]¶

Figure 5: A Word 4.0 document for use as a mail-merge letter

DesignStudio

Those who use DesignStudio and Ready,Set,Go! can get anchored rules by using this tip (PageMaker has a special command for this). Although this method works best with rules wider than 2 points, you should be able to obtain nearly any point size with a little experimentation.

When you're ready to place a rule in your text block, select Zapf Dingbats from the Font menu and type a lowercase *n*, the filled-box character.

Highlight the character, set its track value to .25 or .5 by using the Horiz Spacing command on the DesignStudio Format menu, and set its point size to the rule width you need. Place the cursor after this dingbat, and type as many as you need. The rule will appear on-screen as a thick gray line.

At small point sizes, producing a long rule can be tiresome, so after you've created a portion of the rule, select it, copy it, place the cursor after the last dingbat, and paste until you've filled the column. You can delete the excess. The result now functions as an anchored rule that flows with the text. This "rule" prints as a solid image at both 300 dpi and 2,540 dpi.

One final point — as I mentioned, you may need to experiment to get the point size of this kind of rule to match a tool-drawn rule exactly. For example, to obtain a 1-point rule, you have to set the point size of the dingbats to 1.35.

Jeff Negran
New Brunswick, NJ

Macintosh Portable Owners!

How to Carry your Briefcase, a Garment Bag, your Macintosh Portable, and still BEAT THE 2 ITEM CARRY-ON LIMIT



1988



1989



1990

If you just bought a Macintosh Portable you've **solved one problem** and **created two new ones**. You solved the problem of lugging the old workstation-style Macintosh from office to your home. However, you still have the problem of getting on airplanes and still having only two hands. Please let me explain.

I recently bought a new Mac portable and couldn't wait to travel. Sure, it's still a little heavy but a lot more moveable than the old Macs. I got ready to leave for the airport, picked up the portable with one hand and my garment bag with the other. I looked over and there sat my briefcase. In the briefcase I had my day planner, cassette player, phone, magazines, note pads, pencils, and business files. There was no way that I could leave my briefcase home yet I seemed to have run out of hands!

The solution was to put my briefcase under my right arm, grab the portable with my right hand and pick up the suit case with my left. Not comfortable, convenient, or easy to do, but I at least made it to the airport.

At the gate I ran into problem number two. Even though I had found a way to carry all three cases they wouldn't let me bring more than two carry-on's onto the plane. All I could do was send the garment bag off with a baggage man and hope that it didn't end up in garment bag heaven. As I got off the plane I carried my Mac and my briefcase to the baggage claim area only to find good news and bad news. The good news was that my bag had arrived, the bad news was that it had been run over by a truck.

Happily I want to announce a solution to this problem. If you own a Portable Macintosh you need the EXECUbrief Saddlebag. The Saddlebag carries all of your briefcase items in slim, lightweight, leatherette or nylon, executive style. It conveniently fits over the Mac portable case combining the two cases into one attractive carry-on.

The EXECUbrief was specially designed for MacAcademy, the nation's leading Macintosh training organization. MacAcademy trainers travel to hundreds of cities, and need the very best in convenient luggage. Now a traveler can carry a garment bag in one hand and the Macintosh and a briefcase in the other.

The EXECUbrief is designed to fit in airline storage compartments or fit under your airline seat. The EXECUbrief has storage compartments specifically designed to carry the new small inkjet printers, computer disks, and all of your briefcase items. The EXECUbrief can even hold a change of clothing. (Even if you don't travel, the EXECUbrief eliminates the need for a briefcase.)

The unique EXECUbrief is designed to withstand the rigors of travel and carries a full year, satisfaction or money back guarantee. Here is a Macintosh product designed by Macintosh travelers. The quality is excellent, the benefits immediate.

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EXECUbrief is only $149.

To order call (904) 677-1918 with credit card information or write: EXECUbrief 477 S. Nova Rd. Ormond Beach, FL 32174. Orders may also be sent by FAX to (904) 677-6717. Please add $5.00 shipping and handling per case.

The new EXECUbrief saddlebag eliminates your briefcase.



Now, in one bag, carry computer, printer, disks, and all items needed to be completely portable.



The new EXECUbrief easily carries all items normally found in an executive briefcase.

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Word 4.0

Here's a tip I've found handy when using Microsoft Word and its mail-merge feature.

As you're creating the data file, you might well find that some of your entries are too long or that they just don't fit the pattern you've established in the header information. You can get around this problem by breaking the field entry into two or more lines with a soft Return (Shift-Return). For example, look at the entries in Example 1.

The first entry (John Smith) follows the field pattern nicely, but the second entry (Mary Doe) may look funny if it's all on one line. If you enter a soft Return, the mail-merge will bring that onto the next line without disrupting the field order. Be sure to save the data file as a normal Word document — soft Returns are stripped out of ASCII documents. To see the difference in a Word data file, just be sure that Show Paragraphs is on.

David Zizza
North Billerica, MA

Example 1

```
[The DATA field pattern header]
Name,Address,City,State,Zip

John Smith,12 Mountain View Road,Trenton,NJ,01233

Mary Doe,71 4th Street N.W.
Second Floor,Kingston,OR,41235
```

TypeAlign

When you're using TypeAlign, the text-distortion DA from Adobe, you can highlight an entire text string without dragging from left to right. Just insert your I-beam tool anywhere in the text, and press the Tab key. It's easier than drag-selecting, which can be difficult with curved text, and it's not mentioned in the manual.

Frank Garcia
Vancouver, British Columbia
Canada

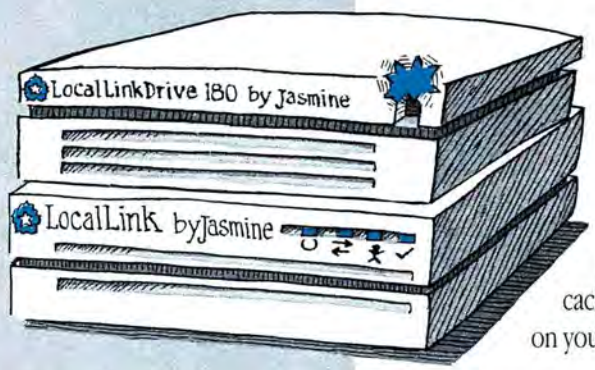
[*The manual does mention that you can triple-click on a text string to select it, but the Tab key provides a nice alternative. — Ed.*]

StuffIt 1.5.1

Users of the shareware file-compression utility StuffIt 1.5.1 by Raymond Lau may start coming across .SIT files that have been stuffed with StuffIt Deluxe, the new commercial version of this useful program. And they will quickly find that they can't use the shareware version to unstuff the files. Well, actually, in many cases they can, but they'll have to get their hands dirty with ResEdit.

Launch ResEdit, and select the .SIT file created with StuffIt Deluxe. Press Command-I (Get Info), and change the

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Figure 6: If you want to open StuffIt Deluxe documents with the shareware version of StuffIt (1.5.1), you'll need to use ResEdit to change the document's file type.

file type from SITD (the StuffIt Deluxe format) to SIT! (the type format for the shareware version). The window should now look like Figure 6.

Save the change, quit ResEdit, and unstuff the compressed file.

K. McCord
Capitola, CA

SuperCard 1.5

A lot of programs on the Mac market create stand-alone applications or self-extracting archives. Two good examples are SuperCard and Compactor.

If you get a project-only version but do not own SuperCard, it is impossible for you to run it. The same goes for Compactor: If you get a Compactor file but do not have the program, you cannot extract the file's contents.

The obvious answer is just to go out and purchase SuperCard or Compactor, but that's not always a cost-effective or timely solution.

A different approach is to convert the SuperCard project into a SuperCard stand-alone application or to convert a Compactor file into a self-extracting archive.

The following method requires ResEdit. If you're converting a SuperCard project, it also requires a SuperCard stand-alone application. If you're converting a Compactor file, it also requires a self-extracting archive.

Follow these steps (I'll refer to the SuperCard project/Compactor file as the *data file*, and the SuperCard stand-alone application/Compactor self-extracting archive as the *app file*):

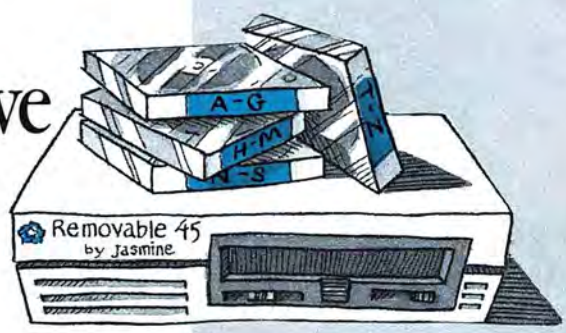
1. Run ResEdit.
2. Open the data file.
3. Open the app file.
4. Select and copy all the resources in the app file.
5. Activate the data-file window.
6. Paste the resources in.
7. Close the app file.
8. Save the data file.
9. Issue a Get Info command (Command-I) for the data file.
10. Change its type to APPL.
11. Quit to the Finder.

Now run the SuperCard or the Compactor file, and it will work perfectly.

Adam Stein
Edison, NJ

[*The author of this tip has written an application that automates this process. It's available in the Zmac Download Library Forum. Search for the keyword* SUPERCARD. — *Ed.*]

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RESIDENT APPLE 35 TRUETYPE FONTS



TrueImage is the new printer standard. It contains TrueType, the same font technology that will go into every Macintosh running System 7.0 and IBM PC running Windows.

Which is why the world's leading font foundries are already designing with TrueType.

But it's comforting to know you won't have to leave your past behind. Because TrueLaser is also PostScript compatible, so you can continue to use your current library of PostScript fonts.

For added versatility, TrueLaser even gives you PCL printer emulation.

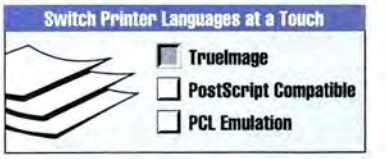


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HELP FOLDER



Questions anyone? Here's where to get answers from the experts. Bob LeVitus is the author of the best-selling Dr. Macintosh. *Andy Ihnatko isn't. But he knows a lot about the Mac, and he's got a heck of an attitude. Together, they're ready to answer your questions about everything Macintosh.*

✉ *Write to Help Folder, c/o* MacUser, *950 Tower Lane, 18th Floor, Foster City, CA 94404.*

Don't want to wait for an answer? Post your question on Zmac, MacUser's *on-line service, and get a reply from Bob, Andy, or one of the other* MacUser *experts. See the masthead in this issue for instructions on how to sign up.*

By Bob LeVitus and Andy Ihnatko

Too Many INIT Icons

Q. I use a Mac Plus (2.5 megabytes with two 45-megabyte hard-disk drives) and lots of INITs. At startup the INIT icons appear in one long row and the last half of them never show on-screen. Because I use CE Software's Aask utility to turn off certain INITs, I'm never sure which ones are on until I check the Control Panel. How can I see *all* the INITs I'm loading?

Mary Stiller
West Lafayette, IN

Bob: *Many of us have experienced this problem, and it's easy to solve with a freeware INIT called IconWrap, written by Ken McLeod. I've used it for years. Just drop it into your System Folder, and reboot. Voilà—the icons automatically go into two rows.*

Andy: *I use IconWrap, too . . . it's great. But gee, Bob, I sure do wonder where our readers can get their hands on public-domain and shareware software*

Bob: *I guess they'll have to read the next letter*

Where's Layout?

Q. In your July '90 column (page 251), you described a public-domain application called Layout 1.9 by Mike O'Connor. I don't have a modem, so I can't download shareware from Zmac. Where can I order this?

Myra Seifert
Eugene, OR

Bob: *The author doesn't sell copies of Layout, but it is widely available from on-line services and user groups. If you don't have a local user group, you can try the BMUG (Berkeley Macintosh User Group) software library, one of the most complete in the country. It offers a catalog of programs (it cost $8 the last time I checked) and sells disks for $4 each, including postage and handling. The BMUG folks are among the nicest, most knowledgeable Mac users I know, and they're a pleasure to do business with. If you don't have a local user group, you might consider joining BMUG just to get its newsletter — a semiannual 300-to-400-page extravaganza.*

BMUG can be reached at 1442A Walnut St., #62, Berkeley, CA 94709-1496; (415) 549-2684.

Andy: *Don't forget the BCS•Mac (Boston Computer Society Macintosh) Group. Not to smear BMUG, Bob, but at the last Boston Expo, it held a big "Salute to Nonbiodegradables" party. BMUG members went all over town collecting mounds of plastic and Styrofoam and then threw it into the dolphin tank at the New England Aquarium. Kind of a black mark against BMUG, if you ask me.*

Bob: *That's a lie, and you know it! How can you promote a group such as BCS•Mac, whose greatest cultural achievement is the invention of Macintosh Jeopardy?*

Andy: *Well, anyway, BCS•Mac also has a nice fat PD catalog and a great monthly magazine. It's located at 48 Grove St., Somerville, MA 02114; (617) 625-7080.*

Bob: *Those of you who hate Massachusetts and California can call (800) 538-9696 for the name of your local Mac user group. Most of 'em sell shareware disks.*

Printer Care and Feeding

Q. How do I know whether a certain material — labels, transparencies, or card stock — is safe to feed through a LaserWriter?

Andrew Rosa
Brooklyn, NY

Andy: *The safest way is to feed it through someone else's LaserWriter first.*

Seriously, three hazards face a sheet of (fill in the blank) as it meanders through the LaserWriter's intestines. First, the page makes a U-turn as it travels from the paper bin into the printing mechanism. If the page is a sheet of labels, some stickers may peel off while making the turn and get stuck among the innards of the machine. The solution is to feed the page manually to avoid the U-turn.

Problem 2 is page thickness. By exhaustive experimentation (that is, by feeding progressively thicker stock through a pal's printer until a savage paper jam occurred), I determined that 60-pound cardboard (business-card stock) is the thickest stuff that can make it through unscathed.

Finally, there's heat from the fusion rollers at the end of the paper path. It can turn a happy sheet of transparency material into a hard glob of plastic nastiness that's terminally fused to the printing mechanism. Because the lowest temperature of the heat rollers is typically about 150 degrees, you can test a sheet of material by setting an iron to 140 degrees or so and passing it over the sheet a few times. If the iron becomes permanently fastened to the ironing board, well, you have the answer.

Bob: *Most office-supply stores sell special labels and transparency film for use with plain-paper copiers, which are very similar to laser printers. I've had good results with Avery 5351 labels and Scotch 503 transparency film.*

Print from the Finder?

Q. Can you print a document directly from the Finder without opening it?

Harold Rhoda
Marlboro, NJ

Andy: *Just select the document, and use the Print command on the Finder's File menu. The Finder will run whatever application created the file and print that sucker right out. This is really useful if you have a whole folder full of documents you want to print. If you select them all and print from the Finder, many applications, such as Word, will show you only one Print dialog box and then print the documents in succession.*

Bob: *You must have a copy of the correct application on a mounted disk, of course, or you get the dreaded "the application is busy or missing . . ." error message. And you can't select two files from different applications — this works with only one application at a time. And many applications, such as Word, won't let you print from the Finder if the application is already open.*

Digital Photography

Q. Help! I work for a small newspaper that is produced almost entirely on the Mac except for two phases of the operation — the photography and printing the actual newsprint version. We don't expect Macs to print the newspaper (yet), but we think they can bypass the drudgery of chemicals; film; and the rest of the time-consuming, mysterious, arcane, never-the-same-results-twice-in-a-row darkroom process.

We know that digital cameras are available. Which ones can you suggest, how do we find them, and how do we get the image from the camera's viewfinder into our PageMaker layouts so that it's suitable for printing on a LaserWriter IINT?

George Ziemann
Bullhead City, AZ

Bob: *It can be done, but it won't be cheap — plan on spending several thousand dollars to install a complete digital photo/halftoning system.*

Digital cameras are available from several manufacturers — Canon, Panasonic, and Sony are probably the best known. These cameras use non-standard 2-inch disks, which can hold between 25 and 50 pictures. Most digital cameras require a separate playback unit for viewing the photos. Prices for complete systems start at around $1,000.

Frame-grabber cards, which convert video signals into TIFF or PICT files, are available from RasterOps, Mass Micro Systems, Aapps, and several other manufacturers. For added functionality, you can input images from a video camera into a graphic file or use a frame grabber to convert a frame of videotape. You can get a frame grabber for less than $1,000.

Finally, you'll need some image-editing software such as Photoshop, Digital Darkroom, or ImageStudio.

Before you invest in a digital system, I suggest you look long and hard at some samples of work done with similar components. Although you might be able to attain results that are comparable to conventional darkroom/halftoning outputting to a high-resolution imagesetter (1,000 dpi or more), I suspect you'll find that you can't even come close with a 300-dpi LaserWriter.

Andy: *Another big problem with electronic photography is that it's still a pretty new field. The electronic cameras I've seen are great for snapshots but aren't nearly as capable as their traditional counterparts. A better solution would be to take pictures with a traditional camera and then scan them in with a good 256-gray-level scanner. That should get you your elusive All-Electronic Newspaper.*

I should warn you, though, that all the Big-Time Professional Graphic Artists I know advise against the use of scanned photos in publications. They contend that scans don't print as well as traditionally halftoned photos, and looking at the results, I have to agree.

Phone Cables for the Keyboard

Q. Can I use a regular telephone handset cord to replace my Mac Plus keyboard cable?

Greg Kaplow
San Jose, CA

Andy: *No — a pre-ADB keyboard cable can serve as a handset cord but not vice versa. Given Apple's recent bout of litigiousness, the Phone Company is understandably afraid of being sued by Apple for infringing on its patents.*

A standard handset cord works if you rewire it, though. Just swap the colored wires at each end so that the yellow wire runs to the black wire and the green wire goes to the red wire (see Figure 1).

The only caveat here is the length of the cord. The absolute limit seems to be 10 feet: Use a 12-foot cord, and you'll find that keystrokes keep dropping out during the long journey from the keyboard to the Mac.

Bob: *How do you figure stuff like that out, Andy?*

Andy: *No comment, except that it gets real boring when both your CD player and your TV are in the shop at the same time.*

X Rays and Your Disks

Q: Is it safe to allow my diskettes to be scanned by an airport X-ray machine?

René Dubilard
Paris, TX

Andy: *If you ask an airline, it'll tell you (without hesitation) that security equipment has absolutely no adverse effects on magnetic media. So far so good. But then, these people also tell you that your 8:00 A.M. flight will leave promptly, so I thought some experimentation was in order.*

I formatted 20 disks, filled them with Lotus spreadsheets and HyperCard stacks (so any damaged files wouldn't be a real loss), and separated them into five envelopes of four floppies each. One envelope stayed home as a control. The other four accompanied me to Logan International Airport in Boston and were run through an X-ray machine one, two, three, or four times. The exciting results are summarized in Figure 2 (please . . . no wagering).

Clearly, you shouldn't trust your floppies to airport-security machines. (At least not the ones at Logan. In my Never-Ending Quest for Truth, I am, of course,



Figure 1: If your Mac Plus' keyboard cable dies, you can make a new one from an ordinary telephone handset cord.

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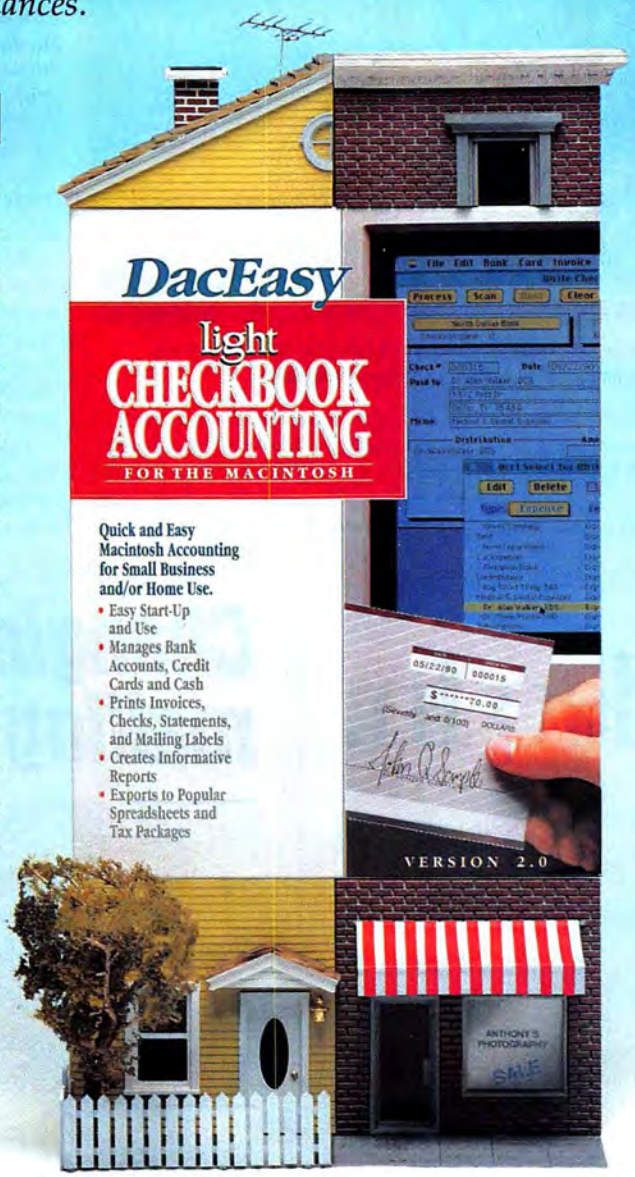
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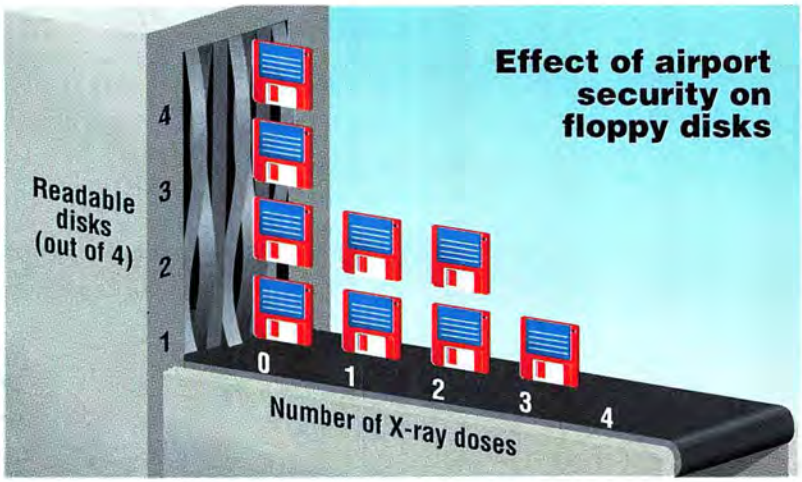


Figure 2: An airport might say that its X-ray machine won't turn your floppy disks into plastic drink coasters, but our empirical observations suggest otherwise.

prepared to undertake a 20-city junket of airports, at MacUser*'s expense) The same caution should apply to hard-disk drives as well.*

But fear not for the safety of your data whilst traipsing through airports. As an airline employee told me (as I brought her line to a standstill with the preceding disk follies), "It is every American's right to request hand inspection." Simply put your hard-disk drive and your floppies into a separate bag, and allow 20 minutes for the procedure. In general, you'll be expected to fieldstrip your bag and prove that your drive works by plugging it in and starting it up.

While we're on the subject of data predators, the antitheft systems in public libraries and bookstores are unlikely to blitz your data. But beware of the desensitizing machines at checkout stands! These machines (decorated with festive "DO NOT PLACE CREDIT CARDS ON THIS MACHINE!" stickers) contain powerful electromagnets.

***Bob:** Don't be so quick to condemn X rays. I've heard the magnets in the motors that run the conveyor belts in airport security systems are the culprit, not the X rays. Although you haven't exactly proven that* X rays *are harmful, it's quite clear that X-ray* machines *are bad for disks.*

I've always asked for a hand-inspection of my floppies and hard-disk drives, so it's nice to know that all that hassle was worthwhile.

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At Host Name prompt, type PHONES.

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From Works 1.1 to 2.0a

Q. I had Microsoft Works version 1.1 for some time and created a lot of lists and files with it. When I got version 2.0a, I installed it on my hard-disk drive and kept it along with version 1.1. I'd like to transfer all the information created with the first version into the new one, but I can't seem to find any information about this in the manual. I called Microsoft, but you know how that is. The person I spoke with quickly explained how simple it is, but I still can't figure out how to do it. Can you help?

Another thing: I read your info on memory upgrades with interest (June '90, page 299). When I heard about System 7.0, I upgraded my Plus to 4 megabytes of RAM. OK, but what do I have now? Aside from the ability to run System 7.0 (which will require at least 2 megabytes of RAM), what does the upgrade do for me? I don't understand the RAM cache and was told not to mess with it. Because I plan to use HyperCard and PageMaker to keep extensive records and write a book, I thought increasing the RAM would be a good idea. Was it?

Henry Anton
Meriden, CT

Bob: *Microsoft was right—it's simple. First launch version 2.0a. Now use the Open command on the File menu to open any file you created with version 1.1. Once the file is open, select Save from the File menu. That's it! The file is now in Works 2.0a format.*

If you want to save a copy in Works 1.1 format for any reason, use the Save As command rather than Save. Give the newer file a different name. (If the original file was called Max, for example, name the new file Max.v2.)

As far as the additional RAM goes, use it to run HyperCard and PageMaker simultaneously under MultiFinder. That way you can have both programs open and copy and paste between them without having to quit one and open the other, which you would have to do with only 1 megabyte of RAM.

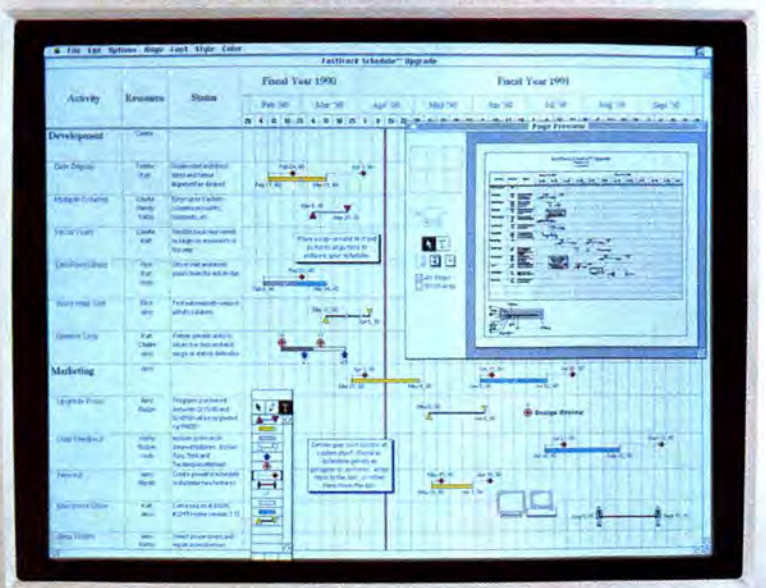
Andy: *The other advantage to having great big wheelbarrows full of RAM is that you can run as many INITs and cdevs as you want — within reason. With 1 megabyte, you have to be stingy to ensure that porky programs such as PageMaker and SuperCard can run (even alone), but with 2 or 4 megabytes under the hood you can toss ATM, SoundMaster, and Oscar into the System Folder without worrying about running out of memory.*

Laser Smearing

Q. This is a simple problem, or should be, but I haven't gotten an answer from my Apple dealer, print shops, or stationery stores. I have a LaserWriter IINT and find the toner used in the cartridges smears on some paper and most kinds of card stock. How can I find out which kind of paper accepts the toner? Some fairly expensive envelopes I printed came out unusable because the address rubbed right off, yet similar envelopes, actually identical to the naked eye, worked fine.

David Parry
Los Angeles, CA

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Bob: When selecting paper that won't smear, stay away from coated stocks and other glossy papers. Toner doesn't adhere well to them. I've found that inexpensive copier paper works well for everyday stuff, and more-expensive paper (such as Hammermill Laser Plus or Laser Print) that's designed for laser printers gives excellent results for more-important work such as camera-ready copy.

If you must use envelopes and paper that are hostile to laser toner, go to an art-supply store and buy a can of spray fixative, the stuff artists spray onto charcoal or pastel drawings to keep them from smearing. I use the Krylon brand, but I suspect that any spray fixative can work as well. After printing the envelopes, pick them up carefully and spray the printed area with a very light mist. That ought to do it.

***Andy:** I've heard that hairspray can also do the trick, but I haven't had a chance to try it. My hair-care arsenal consists of whatever shampoo's on sale at K-mart.*

Save the Screens?

Q. I've heard that screen savers, such as After Dark and Pyro!, can protect my screen from getting burned-in images after the computer idles for long periods of time. Do I really need this type of program to protect my screen? Couldn't I simply turn the brightness all the way down?

Clint Woker
Okawville, IL

***Bob:** If you can remember always to turn down the brightness when you leave your computer, then, no, you don't need a screen saver. The beauty of screen savers is that they never forget. You decide how long you want your computer to sit idle before the screen saver kicks in. After that, the screen saver remembers for you. That's not the only reason to buy one, though: Screen savers are really cool looking (see Figure 3).*

***Andy:** It's the old shirt-versus-suit struggle. The college guys in T-shirts can say, "Wow . . . it's useless but it puts bodacious fireworks onto the screen!"*



Figure 3: Here's what would happen if you could run the competing screen savers After Dark and Pyro! at the same time. Don't try this at home!

The corporate executives, on the other hand, have to explain to their bosses that it "prevents costly burn-in" (which happens only if you leave the screen on for, like, a whole month) and that it's a clever "office-productivity solution," and so on — if they don't want to get fired.

I've also heard of office managers going berserk at the sudden appearance of fireworks, fish, or flying toasters on-screen: "VIRUS! EEEEEEEK!!! IT'S A VIRUS!!! FORMAT THE HARD DRIVE!!!"

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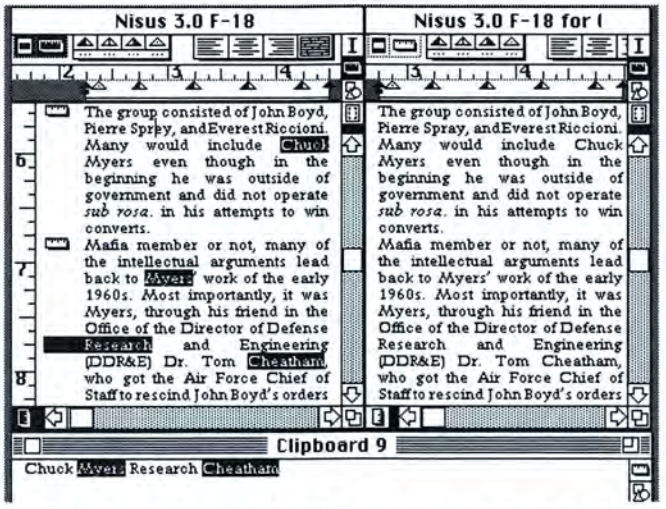
"1989 Best Word Processor" MacUser U.K.

The reason you bought a Macintosh instead of an IBM®PC is the same reason you'll prefer writing with Nisus® 3.0 rather than Word 4.0

A built-in word processing language; noncontiguous text selection; "find and replace" any font, style, size, or color; mix column formats; built-in graphics; and super style sheets down to the character level make Nisus 3.0 easier to learn, easier to use, and much more powerful

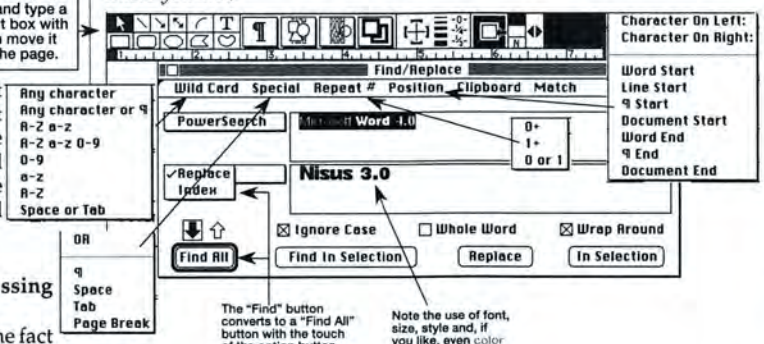
You can "Place" any page of a Nisus file containing text and graphics in another Nisus file where it becomes a picture called a "Placed Page Graphic." Double clicking this "Placed Page Graphic" will open the original file for editing. Graphics can be drawn or pasted to three different layers: the text layer, behind the text, and in front of the text giving you total control.

If you're new to the Macintosh word processing market you probably want a word processor that is easy to use. If you've been around for a while, you undoubtedly want a powerful word processor. Chances are you have tried either MacWrite or Microsoft® Word 4.0. One is easy to use, the other offers power. Both, however, have severe limitations which is why we developed Nisus in the first place. Here with abject brevity are just a few of the reasons we know you'll find Nisus 3.0 easy to use with all the power you'll ever want.



The automatic file comparison above sent the cursor directly to the first instance where the files differed, which in this case was Sprey versus Spray. Note the noncontiguous text selection works even in any of the 10 editable clipboards. (Note the vertical ruler on the left which allows you to keep track of where you are.)

You can simply click and draw on a transparent layer, either behind or in front of the text, and have the text wrap around the graphic or flow through it. Draw a simple arrow and type a margin call-out box with one click, then move it anywhere on the page.



Built-in word processing language

For power, consider the fact that Nisus allows you to create custom routines beyond what we have already done for you, with our built-in word processing language. You don't have to use this feature, but it's there if you need it. It is one of the many features that distinguishes Nisus 3.0 from Word 4.0. It will let you, for example, create routines to index every word in a document, while stripping out *and*, *or*, *the*, *but*, and other nonessential words. One user even built a routine to index all proper names. Another user developed a method to find and correct all double words, periods, and extra spaces. The opportunities are unlimited.

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Nisus 3.0 and Word 4.0 Feature Comparison	Nisus 3.0	Word 4.0
Built-in word processing language	■	
Noncontiguous text selection	■	
Mix column formats	■	
Find all and replace or index	■	
Find any **font,** *style,* size, or color	■	
Place text or graphic linked to parent text or graphic file	■	
Find and replace in open or unopened files	■	
Cross-reference text	■	
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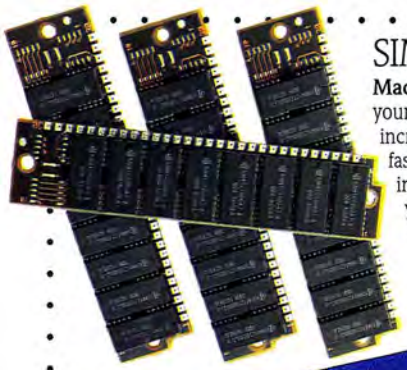
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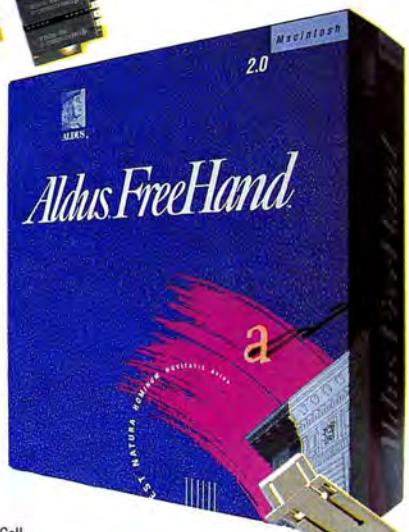
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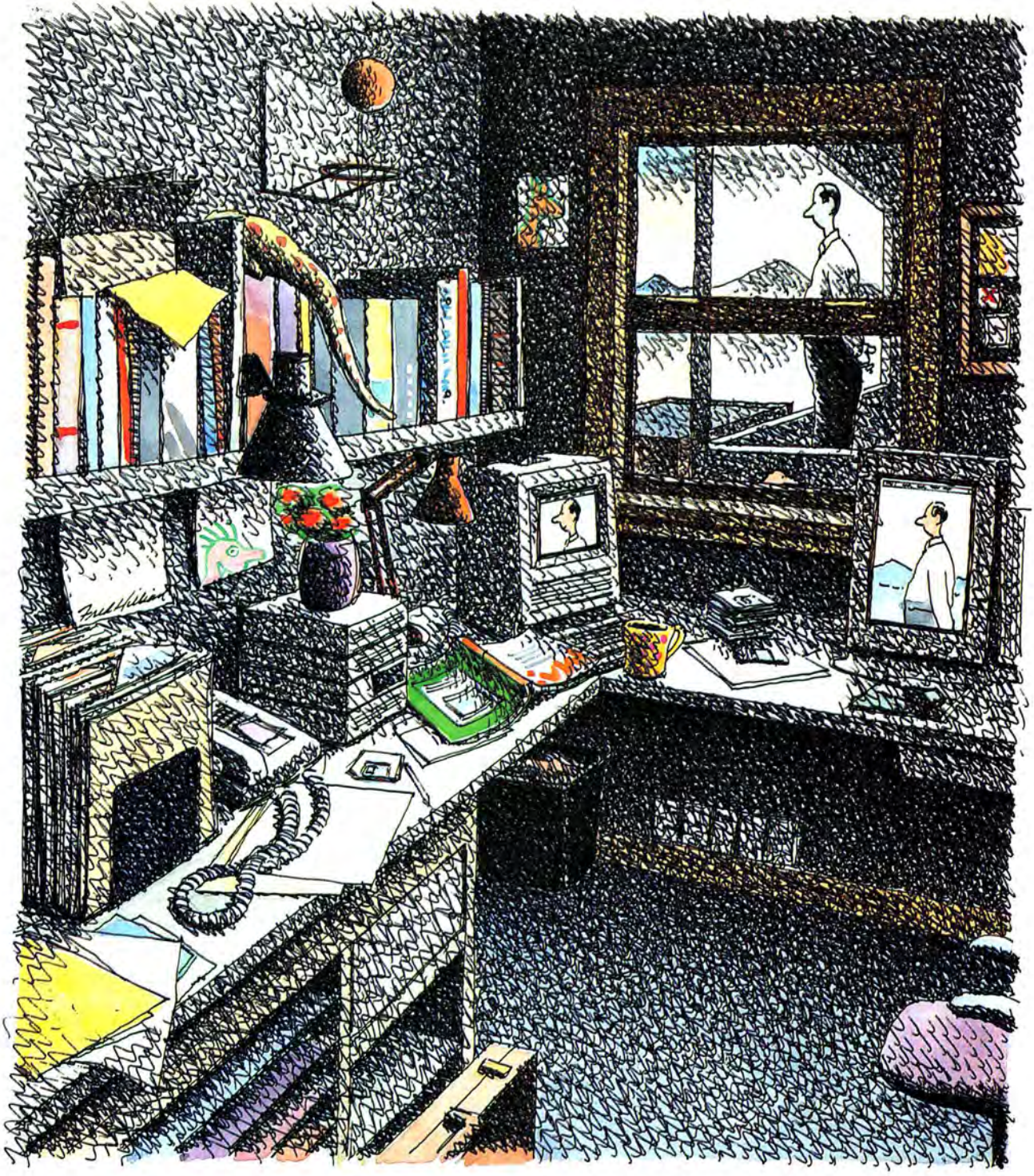
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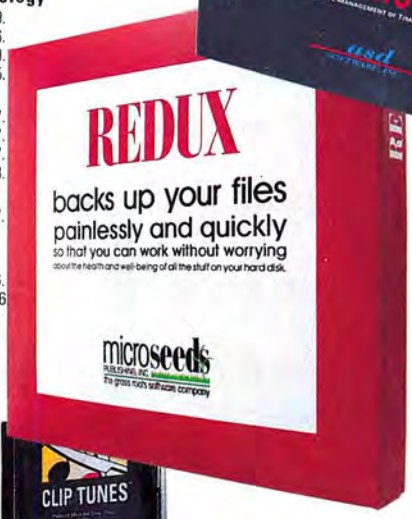
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Thunderscan 5.0 ... 189.

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Altra
Felix ... 124.

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UPS 110SE ... 205.

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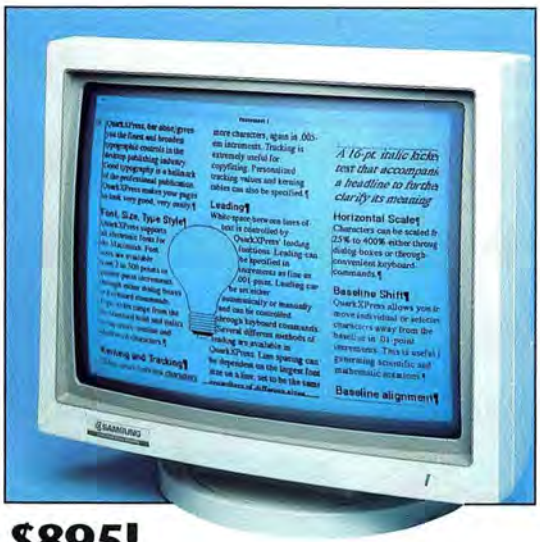
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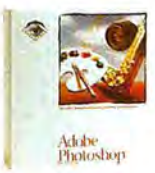
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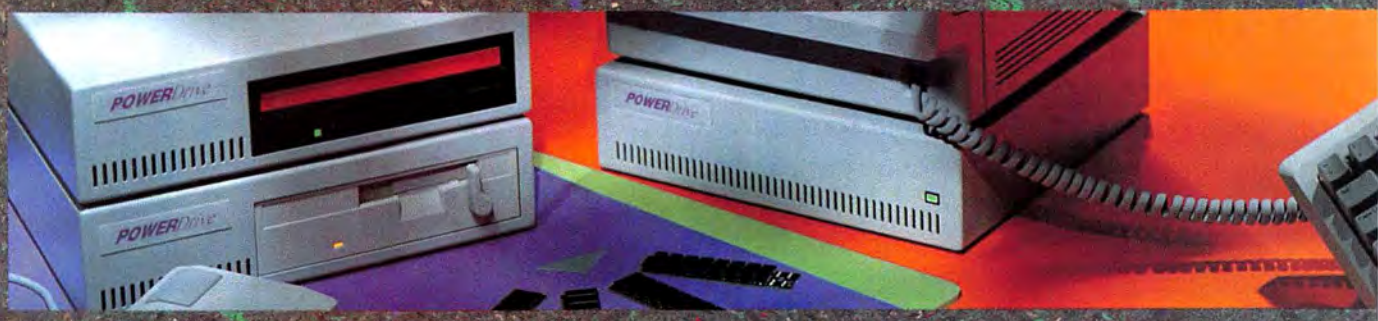
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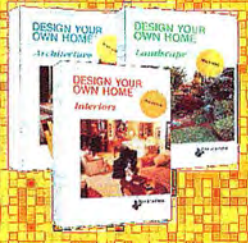




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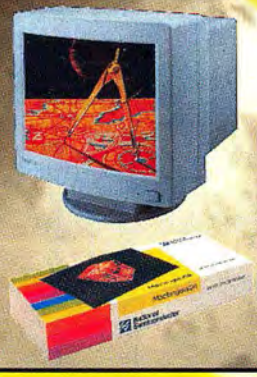
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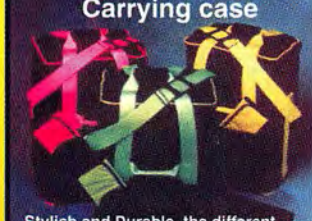
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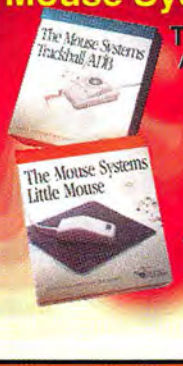
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Education

Alphabet Blocks ŧŧŧŧŧ
Alphabet Blocks teaches prereaders the letters and sounds of the alphabet. The digitized voice of an on-screen elf is clear and pleasant. Very intuitive. Requires Mac Plus or later. $59.95. Bright Star Technology, 1450 114th Ave. S.E., Suite 200, Bellevue, WA 98004. (206) 451-3697. (May '88)

American Discovery ŧŧŧ
American Discovery is an interactive United States geography game that teaches states; capitals; and, in a roundabout manner, postal codes. Version 2.3. Requires Mac 512K. $49.95. Great Wave Software, 5353 Scotts Valley Drive, Scotts Valley, CA 95066. (408) 438-1990. (May '88)

Interactive Physics ŧŧŧŧŧ
Interactive Physics is the best physics-teaching tool available. It lets you set up and run experiments on-screen. There are limits to the number of masses and connectors, but that doesn't detract much from the overall program. It has an excellent manual. Version 1.0. Requires Mac Plus or later and System 6.0.3 or later. $449; education, $249. Knowledge Revolution, 497 Vermont St., San Francisco, CA 94107. (415) 553-8153. (Apr '90)★'89 Eddy

KidsMath ŧŧŧŧ
KidsMath is a set of eight educational applications for three-to-eight-year-old children. The quality varies, ranging from adequate to superb. It doesn't support color or large monitors. Version 1.1. Requires any Mac with 512K of RAM. $49.95. Great Wave Software, 5353 Scotts Valley Drive, Scotts Valley, CA 95066. (408) 438-1990. (May '90)

LXR•TEST ŧŧŧŧ
LXR•TEST generates tests from a database of questions. Makes it easy to modify and scramble test questions. Flexible output. Version 4.0. Requires Mac Plus or later. $149. Logic eXtension Resources, 9651-C Business Center Drive, Rancho Cucamonga, CA 91730. (714) 980-0046. (May '88)

Mavis Beacon Teaches Typing! ŧŧŧŧ
Mavis Beacon Teaches Typing! has more features than a Selectric. Lots of diagnostics concerning typos. Incomplete documentation. Version 1.1. Requires Mac Plus or later. $49.95. The Software Toolworks, 19808 Nordhoff Place, Chatsworth, CA 91311. (818) 885-9000. CP (Nov '88)

NumberMaze ŧŧŧŧ½
NumberMaze makes practicing basic math skills a game. Children ages 5 through 12 work their way through various mazes by solving numerical and word problems in counting, addition, subtraction, multiplication, and division. Selectable problem types and difficulty. Games can be customized with familiar names and additional levels. Based on five major math-textbook series for grades one through six. Version 1.0. Requires Mac 512K or later. $49.95. Great Wave Software, 5353 Scotts Valley Drive, Scotts Valley, CA 95066. (408) 438-1990.

Physics ŧŧŧŧ½
Physics is a capable, intelligent, well-designed study aid. Covers vectors to thermodynamics to the nature of light. Animated experiments let you try out concepts. Requires Mac 512K or later. $99.95. Brøderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101. (415) 492-3200. CP (Jan '88)

Reader Rabbit ŧŧŧŧŧ
Reader Rabbit teaches four-to-eight-year-olds how to read, with four elegant games that build on one another. Version 2.2. Requires Mac SE/30 or later. $59.95. The Learning Co., 6493 Kaiser Drive, Fremont, CA 94555. (800) 852-2255. CP (June '88)

Type! ŧŧŧŧ½
Type! is a typing tutorial that is both practical and flashy. It allows users to interrupt and move easily among functions, but use of the Return key and space bar are assumed but never explained. Version 1.0. Requires Mac 512K or later. $29.95. Brøderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101. (415) 492-3200. (Nov '88)

TYPING INSTRUCTOR Encore ŧŧŧŧ
TYPING INSTRUCTOR Encore recognizes that it's being used on a word processor. Although it is easy to control, the program has strange bugs. Version 3.0. Requires Mac 512K or later. $29.95. Individual Software, 125 Shoreway Road, Suite 3000, San Carlos, CA 94070. (800) 331-3313 or (800) 874-2042 (in CA). (Nov '88)

Typing Tutor IV+ ŧŧŧ
Typing Tutor IV+ consistently tests your use of all keys, including seldom-used ones. It's hard to maintain user's attention span, as the testing material is unimaginative. Version 1.2. Requires Mac 512K or later. $49.95. Simon & Schuster Software, 15 Columbus Circle, New York, NY 10023. (212) 373-8142. (Nov '88)

The Vietnam War ŧŧŧŧŧ
The Vietnam War is a stack that uses HyperCard fully and brilliantly to present a fair view of the Vietnam conflict. It is so compelling that it's impossible to put down. Version 2.0. Requires Mac Plus or later, HyperCard, and a hard-disk drive. $24.95. Regeneration Software, 377 Collado Drive, Scotts Valley, CA 95066. (408) 438-5791. (Apr '90)

Voyager, the Interactive Desktop Planetarium ŧŧŧŧŧ
Voyager, the Interactive Desktop Planetarium, lets you view the sky as a star chart, as a celestial sphere, or as seen from anywhere in the universe. Includes an extensive astronomical database. Terrific learning tool. Version 1.2. $124.50. Carina Software, 830 Williams St., San Leandro, CA 94577. (415) 352-7328. (Sept '89)

Entertainment

Apache Strike ŧŧ
Apache Strike would have been an excellent arcade game in the late '70s. Now, it's passé. Navigate a helicopter to destroy ever-increasing numbers of enemy aircraft and tanks. Mac II-hostile. Version 1.1. Requires Mac 512K. $49.95. Silicon Beach Software, P.O. Box 261430, San Diego, CA 92126. (619) 695-6956. (July '88)

Balance of the Planet ŧŧŧŧ
Balance of the Planet is similar to Chris Crawford's earlier classic, Balance of Power, except here the goal is global environmental survival. It's difficult to win, but eventually you should be able to get positive scores, and your awareness of environmental issues will be greatly enhanced. Players can set the basic bias of the game. Version 1.0. $49.95. Accolade, c/o StarPat, 237 22nd St., Greeley, CO 80631. (800) 245-7744. (Aug '90)

Beyond Dark Castle ŧŧŧ½
Beyond Dark Castle brings back Prince Duncan in an encore performance to run, jump, and beat his way to victory. But really, it's just more of the same. Version 1.0. Requires Mac 512KE or later. $49.95. Silicon Beach Software, P.O. Box 261430, San Diego, CA 92126. (619) 695-6956. (Aug '88)

Beyond Zork ŧŧŧŧ½
Beyond Zork is yet another installment in the famous Zork series of text adventures. Find the fabled Coconut of Quendor to restore failing magic in this expert-level game. On-screen mapping and the Macintosh's window environment are utilized. $19.95. Infocom, 3885 Bohannon Drive, Menlo Park, CA 94025. (415) 329-7616. (Apr '88)

Mice Ratings: ŧ ... ŧ½ ... ŧŧ ... ŧŧ½ ... ŧŧŧ ... ŧŧŧ½ ... ŧŧŧŧ ... ŧŧŧŧ½ ... ŧŧŧŧŧ

Bomber ★★★★
Bomber is a great HyperCard-based simulation. You attack Germany during WW II, flying a B-17. Great sound (you'll probably need 2 megabytes of RAM); headphones are provided so you don't disturb others. Requires HyperCard 1.2.1 or later. $39.95. In-Line Design, 70 W. 95th St., Suite 26F, New York, NY 10025. (212) 222-4837. (Feb '90)

Chessmaster 2000 ★★★★★
Chessmaster 2000 is a masterful chess program that will appeal to novices and experts. You can view the board from 2-D or 3-D perspectives and also turn it for a better look. Play is smooth and easy, and the program responds by voice. You may get tired of hearing "Gotcha," though. Version 1.02. $44.95. The Software Toolworks, 19808 Nordhoff Place, Chatsworth, CA 91311. (818) 885-9000. CP (July '87)

Chuck Yeager's Advanced Flight Trainer ★★
Chuck Yeager's Advanced Flight Trainer doesn't quite have the right stuff to hold interest for long. Simplistic controls. Lacks features found in versions for other computers. Version 1.0. Requires Mac 512KE or later. $49.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. (800) 245-4525 or (415) 571-7171. (Nov '88)

Crystal Quest ★★★★★
Crystal Quest combines all the good elements of nearly every video game ever made. Move a piece around to gobble up points and crystals. Shoot the nasties, and get through the goal before they get you. Excellent sound effects. In color on the Mac II. Version 2.2X. Requires Mac 512K or later. $49.95. Casady and Greene, P.O. Box 223779, Carmel, CA 93922. (408) 624-8716. (Apr '88) ★'88 Eddy

Dark Castle ★★★★★
Dark Castle is an outstanding achievement in action games, integrating sound with superb animation and graphics. You'll need better-than-average hand-eye coordination, but it's well worth the effort. Version 1.1. Requires Mac 512K or later. $49.95. Silicon Beach Software, P.O. Box 261430, San Diego, CA 92126. (619) 695-6956. (Apr '87) ★'87 Eddy

Falcon ★★★★½
Falcon simulates an F-16 fighter jet with gut-tightening, sweat-making realism. Go against MiGs and dodge SAMs. Can be played via modem against other humans. Version 2.2. Requires Mac Plus or later. $59.95. Spectrum HoloByte, 2061 Challenger Drive, Alameda, CA 94501. (415) 522-3584. (May '88)

Fool's Errand ★★★★★
Fool's Errand is an outstanding collection of 80 puzzles woven around a mythical theme of an evil priestess and the search for wisdom. Version 2.0. Requires Mac 512K or later. $49.95. Miles Computing, 5115 Douglas Fir Road, Suite I, Calabasas, CA 91302. (818) 340-6300. (July '88)

Halls of Montezuma ★★★★½
Halls of Montezuma is a classic move-the-units war game that is adapted for the Mac. The scenarios cover famous U.S. Marine battles. It provides color and black-and-white versions for all scenarios, with good performance and play. You can even create your own scenarios. Requires Mac Plus or later. $44.95. Electronic Arts, 1810 Gateway Drive, San Mateo, CA 94404. (415) 571-7171. (Apr '90)

Handwriting Analyst ★★★★½
Handwriting Analyst produces a personality profile based on answers to questions about your handwriting. It's simple, and the results will amaze and astound. Version 3.0. $69.95. Ciasa, 2017 Cedar St., Berkeley, CA 94709. (415) 644-2771. (Apr '88)

Ishido ★★★★★
Ishido is a strategy game with a few twists. The game is good but not great. Its programming is elegant and very polished. There are many options, including solitaire and multiuser modes. Requires Mac Plus or later. $49.95. Accolade, 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128. (408) 985-1700. (May '90)

Lunar Rescue ★★★★½
Lunar Rescue puts you in the role of a benevolent trader ready to save a moon colony from invasion. Blast the enemy while you travel from town to town trading goods for the supplies you need for your mission. Version 1.0. Requires Mac 512KE or later. $59.95. XOR Corp., 7607 Bush Lake Road, Minneapolis, MN 55435. (800) 635-2425 or (612) 831-0444. CP (Jan '89)

MacRacquetball ★★★½
MacRacquetball uses digitized videos and sounds of professional players for a realistic simulation. Has lots of control settings and can be played with someone else via a modem or between hard-wired Macintoshes. Users must turn off hard-disk drives before playing. Version 2.0. $59.95. XOR Corp., 7607 Bush Lake Road, Minneapolis, MN 55435. (800) 635-2425 or (612) 831-0444. CP (Oct '87)

NFL Pro League Football ★★★★½
NFL Pro League Football is a professional football-league simulation that encourages people to play people, not the machine. Fast, with lots of stats. Spotty manual. Version 1.0. Requires Macintosh Plus or later. $49.95. Micro Sports, Inc., 1410 Mountain Ash Drive, Hixon, TN 37343. (800) 543-6735. (Apr '88)

Patton vs. Rommel ★★★★
Patton vs. Rommel is a traditional-style strategic war game, covering events in Normandy in 1944. Although it's complex, it's well designed and very playable. $19.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. (800) 245-4525 or (415) 571-7171. CP (Apr '87)

Pipe Dream ★★★★★
Pipe Dream is an addictive game that demands a nearly perfect mixture of strategy and speed. You must build a pipeline fast enough to prevent the stuff in the line from running out — that's it. It has 36 levels of play. Version 1.0. Requires Mac Plus or later. $24.95. Lucasfilm Ltd., Games Division, P.O. Box 10307, San Rafael, CA 94912. (415) 662-1902. CP: must use an included decoding wheel. (May '90)

Quarterstaff ★★★★
Quarterstaff is a fantasy adventure game of the typical good-versus-evil variety. Ability to use characters in other adventures gives this game a lot of potential for development. Version 1.2. Requires Macintosh Plus or later. $49.95. Simulated Environment Systems, 800 S. Pacific Coast Highway, Redondo Beach, CA 90277. (Mar '88)

Shadowgate ★★★★½
Shadowgate is an icon-based graphic adventure. You, as the seed of prophecy, must save the world from the evil warlock. Far surpasses all others with great animated graphics, sound, and adventure. $49.95. Mindscape, 3444 Dundee Road, Northbrook, IL 60062. (708) 480-7667. CP (Dec '87)

Shanghai ★★★★★
Shanghai is a wonderful strategy game. The new version adds gorgeous color, good sound, and new intelligence. The game can now tell you when there are no more moves. Version 2.0. Requires any Mac. $29.95. Mediagenic, 3885 Bohannon Drive, Menlo Park, CA 94025. (415) 329-0500. (June '90)

SimCity ★★★★
SimCity is an animated game that's also a city-planning simulator. You can work on any one of eight scenarios included in the package or build your own city from the ground up. Evaluation window gives you instant feedback on your efforts. Version 1.2. Requires Mac 512K or later. $49.95; Terrain Editor, $24.95. Brøderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101. (415) 492-3200. CP (June '89) ★'89 Eddy

SimCity Supreme ★★★★★
SimCity Supreme is the color version of SimCity. Has all the advantages and virtues of the original, plus it's not copy protected. Version 1.1c. Requires Mac 512K or later. $69.95. Brøderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101. (415) 492-3200. (June '89)

Solitaire Royale ★★★★
Solitaire Royale is a collection of eight solitaire card games. The Tour mode cycles through each game. Tournament deals the same hand for several players. Monochrome, version 1.1; color, version 1.0. $34.95. Spectrum HoloByte, 2061 Challenger Drive, Alameda, CA 94501. (415) 522-3584. CP (May '88)

Star Fleet I: The War Begins! ★★★★
Star Fleet I: The War Begins! is a space opera à la Star Trek. Rise through the ranks from ensign to admiral in this serialized adventure. Version 2.1. Requires Macintosh 512K or later. $55. Interstel Corp., P.O. Box 57825, Webster, TX 77598. (713) 486-4163. (May '88)

Strategic Conquest Plus ★★★★½
Strategic Conquest Plus challenges you to discover an unexplored world and conquer it by manufacturing and deploying armies, ships, and planes. A two-disk game that doesn't support an external drive. Version 2.055. Requires Macintosh 512K or later. $59.95. Premiere Technology, P.O. Box 11138, San Francisco, CA 94101. (415) 882-7766. CP (Feb '88)

Synchronicity ★★★★
Synchronicity is mood-control software. Based on the *I Ching*, it can be used as a stress-reduction tool. Beautiful artwork and sounds. Even skeptics like it. Version 2.0. Requires Mac Plus or later. $49.95. Visionary Software, P.O. Box 69191, Portland, OR 97201. (503) 246-6200. (Mar '90)

HARDWARE AND ACCESSORIES

CasioLink ★★★★½
CasioLink is a hardware and software package that links the popular Casio BOSS series of electronic organizers to a Macintosh. The cable is fine. The software is a bit limited and clunky, but it works. Can import and export to text files and HyperCard stacks (has some trouble importing from stacks). Version 1.0. Requires Mac Plus or later. $109.95. Traveling Software, 18702 N. Creek Parkway, Bothell, WA 98011. (800) 343-8080 or (206) 483-8088. (May '90)

The Ergotron Workstation ★★★★

The Ergotron Workstation is the best, most versatile computer workstation around. This free-standing or wall-mountable heavy steel unit includes a high shelf for your Mac II and a movable, damped arm for your monitor. The unit comes in a variety of configurations. $600 and up. Ergotron, 3450 Yankee Drive, Suite 100, Eagan, MN 55121. (800) 888-8458. (Mar '89)

Grappler LX ★★★★

Grappler LX hooks Macs up to parallel laser and 24-pin letter-quality printers. A cable, driver software, and special fonts combine to make dozens of once-unfriendly printers now compatible with the Mac. Requires Mac with 1 megabyte and a parallel printer. $199. Orange Micro, Inc., 1400 N. Lakeview Ave., Anaheim, CA 92807. (800) 223-8029 or (714) 779-2772. (Nov '88)

Macintosh Portable ★★★★

The Macintosh Portable is Apple's first portable. Considered by those who have never used one to be too big (it is), too heavy (16 pounds), too slow (68000 at 16 megahertz), and too expensive. Loved by all who have one or have used one for a while. A good beginning. $7,597 including modem, extra megabyte of RAM, and hard-disk drive. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (Mar '90) ★'89 Eddy

MacTable ★★★★★

MacTable is an elegant Danish worktable that holds a Mac and printer with room to spare. The table, 30 inches deep by 58 inches wide, is made of particleboard and must be assembled. Cabinet is optional. Table, $339; cabinet, $149. ScanCo, P.O. Box 3217, Redmond, WA 98073-3217. (206) 481-5434. (Jun '90)

Madson Portable Case ★★★★★

The Madson Portable Case is a soft case for the Mac Portable that lets you use your Portable without taking it out of the case. The only drawback is the lack of extra storage space. $90. The Madson Line, P.O. Box 338, Corte Madera, CA 94925. (415) 927-3600. (Sept '90)

The Portable Attache ★★★★

The Portable Attache is an attractive alternative to the Mac Portable case. Manufactured by Zero Halliburton, it's made of aluminum, is approximately the same size as the Mac Portable case, and comes with a handy accessory case (the perfect size for a Diconix printer) that fits inside. The file pocket in the Portable Attache detaches and becomes a portfolio. The Portable Attache is not suitable for checking on an airline, but the Portable Attache/Transport case (also available exclusively from EDC) is. $329.95; Portable Attache/Transport case, $369.95. EDC, 13101 Washington Blvd., Suite 110, Los Angeles, CA 90066. (213) 578-9712. (Sept '90)

StarController ★★★½

The StarController distributes AppleTalk signals to devices on a network and provides some network-management and troubleshooting capabilities. It's very reliable, with excellent documentation and tech support. $1,295. Farallon Computing, 2000 Powell St., Emeryville, CA 94608. (415) 596-9000. (May '90)

Tefax RA2110M ★★★

Tefax is a combination regular fax machine/fax modem. Although this sounds like the best of both worlds, it's not. The RA2110M lacks many necessary fax features such as a paper cutter, and the fax/modem software (a custom version of BackFax) isn't very good. Right now, buy a separate fax machine and a fax modem. $1,595. Relisys, 320 S. Milpitas Blvd., Milpitas, CA 95035. (408) 945-9000. (June '90)

TurboStar ★★★½

The TurboStar distributes AppleTalk signals to devices on a network and provides some network-management and troubleshooting capabilities. Performance can be poor in certain wiring configurations. $1,795. Nuvotech, 2015 Bridgeway, Suite 204, Sausalito, CA 94965. (800) 232-9922 or (415) 331-7815. (May '90)

• INPUT DEVICES

A+ Mouse ★★★★

The A+ Mouse uses infrared light reflected from a special pad to track mouse movement. No moving parts. Relative movement and clicking action feel similar to those of the standard Mac mouse. Non-ADB version, $99.95; ADB version, $129.95. MSC Technologies, 47505 Seabridge Drive, Fremont, CA 94538. (415) 656-1117. (Oct '89)

Apple Scanner ★★★½

The Apple Scanner is not the state of the art but is adequate for scanner neophytes. The 4-bit (16 gray level) scanner comes with AppleScan software and HyperScan, written by Bill Atkinson. Requires System 6.0 or later, hard-disk drive for full-page work, and SCSI connection cables. $1,799. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (Feb '89)

BitPad Plus ★★★½

The BitPad Plus offers basic drawing capabilities but no macro-making capability. Uses pens and pucks. Scaling of screen-to-pad ratio must be entered in pixels per inch. Must use MultiFinder to change settings while in an application. $495. SummaGraphics, 60 Silvermine Road, Seymour, CT 06483. (203) 881-5377. (Oct '89)

CalComp 2300A ★★★★½

The CalComp 2300A is a full-featured drawing tablet that lets you resize and reposition the drawing area. Three sizes, six different input devices (pens and pucks), and several software templates are available. AE Template Manager lets you perform all the System and HyperCard menu functions on the tablet. $595 to $2,495, depending on size. CalComp, 14555 N. 82nd St., Scottsdale, AZ 85260. (602) 948-6540. (Oct '89)

Felix ★★★½

Felix is a 5.75-inch-square optical-tracking mouse replacement. Space saver but awkward for lefties. It has a button on top of the pointer handle for mouse clicks. Drawing setting for absolute movement. Mac Plus and ADB versions available. $169. ALTRA Technology, 1200 Skyline Drive, Laramie, WY 82070. (800) 726-6153 or (307) 745-7538. (Oct '89)

Focus S800GS ★★★★

The Focus S800GS is a 400-dpi, 6-bit gray-scale scanner that simulates resolutions up to 800 dpi. It has superior resolution and good halftone quality. Professional-quality software has extensive editing features and printing options. $4,350; software, $495. Agfa Compugraphic, 200 Ballard Vale St., Wilmington, MA 01887. (508) 658-5600. (June '89) ★'88 Eddy

FreeWheel Systems ★★★½

The FreeWheel Pointer determines the user's head position by bouncing infrared light off a small, lightweight mirror on the user's forehead. Compact receiver unit and puff switch (can be mounted wherever convenient). Standard keyboard arrangement on-screen. Mac II and SE versions, $1,395; ADB adapter, $150. Pointer Systems, One Mill St., Burlington, VT 05401. (802) 658-3260. (Oct '89)

HeadMaster ★★★½

The HeadMaster is designed for users with little or no use of their hands. It uses ultrasound signals emitted from a headset to determine the position of the user's head. Has a puff tube for the mouse button. Emulates all mouse functions. A variety of on-screen keyboards are available for typing. Available for Mac 512K, Plus, SE, and II. $900. Prentke Romich Co., 1022 Heyl Road, Wooster, OH 44691. (800) 262-1984 or (216) 262-1984. (Oct '89)

IS/ADB ★★★★

The IS/ADB is a tablet that comes in three sizes with a choice of seven pointing devices, including multibutton pucks and multibutton styli. Operates in either absolute or relative modes; active-area resizing on menu is handy for intensive drawing work. Twelve function keys, good for creating macros. $395 to $965. Kurta, 3007 E. Chambers St., Tempe, AZ 85040. (602) 276-5533. (Oct '89)

IS/ONE Tablet ★★★½

The IS/ONE Tablet with Penworks software lets you use a corded or cordless pen or mouse and a high-res tablet for precise graphics input. Minor bugs with some applications and DAs. Keystroke macros can be launched from the tablet. Minimal documentation. Requires Mac Plus or later. $525 to $995. Kurta, 3007 E. Chambers St., Tempe, AZ 85040. (602) 276-5533. (Jan '88)

LYNX Trackball ★★★½

The LYNX Trackball has an encased trackball. Small size makes it easy to control. Requires some wrist movement to access the buttons. Comes in ADB and non-ADB versions. $99.95. Asher Engineering, 120 Linden Ave., Long Beach, CA 90802. (800) 321-5969 or (213) 590-9990. (Oct '89)

Mac 'N Touch ★★★★

Mac 'N Touch is a touch screen recommended for applications requiring a lot of pointing and clicking; works less well for programs such as graphics packages that require fine control. Available as an add-in screen for Mac SE and II models and as a snap-on screen for the SE only. Mac 'N Touch Add-In, $745 (SE), $895 (Mac II); Mac 'N Touch Snap-On, $595 (SE only). MicroTouch Systems, 55 Jonspin Road, Wilmington, MA 01887. (508) 694-9900. (Oct '89)

Mac 105 ADB Extended Keyboard ★★★½

The Mac 105 ADB Extended Keyboard is a good alternative to Apple's Extended Keyboard, with a larger Return key, larger and more-sculpted key tops, and a lower overall weight. Requires Mac SE or Mac II. $159; with QuicKeys, $189. Cutting Edge, P.O. Box 1259, Evanston, WY 82931-1259. (307) 789-0582. (Feb '89)

Mac-101 ★★★★

The Mac-101 is a keyboard alternative that has a good feel to it. Has a keypad, 15 function keys, and more. The 101-Keys DA lets you define macros. Also comes in an ADB version for the SE and II. Requires Mac 512K or later. $169.95. DataDesk International, 7651 Haskell Ave., Van Nuys, CA 91406. (818) 780-1674. (Apr '88)

Mach IV Plus ★★★½

The Mach IV Plus has buttons on either side of the joystick

and one atop the joystick. Can be used as a mouse emulator. Comes in ADB and non-ADB models. Also available is a peripheral called Mirage that adapts earlier non-ADB CH joysticks for ADB use. Mach IV, $89.95; Mirage, $54.95. CH Products, 970 Park Center Drive, Vista, CA 92083. (800) 624-5804 or (619) 598-2518. (Oct '89)

Macintizer ‡‡‡

The Macintizer compares favorably with other tablets in terms of mouse emulation and drawing but lacks some software features. No built-in capability for using or creating overlay templates. Provides developer stacks for HyperTalk and Pascal. Active area resized through Control Panel. HyperCard-stack documentation. $499. GTCO, 7125 Riverwood Drive, Columbia, MD 21046. (301) 381-6688. (Oct '89)

MacTablet ‡‡‡‡

The MacTablet is a stylus-driven graphics tablet. Users can easily sketch or trace art using this absolute-positioning device. Has a working area the size of the Mac screen. Allows concurrent use of the mouse. $495. MacTablet Upgrade Kit available for $99.50. Summagraphics, 60 Silver Mine Road, Seymour, CT 06483. (203) 881-5400. (July '88)

MacTRAC ‡‡‡½

The MacTRAC has three buttons — a lock and two clicks — located above the trackball. Equal ease of use for right- and left-handed people. Light signals that the lock button has been pushed. $99; ADB version, $119. MicroSpeed, 44000 Old Warm Springs Blvd., Fremont, CA 94538. (415) 490-1403. (Oct '89)

McIntyre ‡‡‡½

The McIntyre is a joystick for people who can't use their hands. Can be mounted on a gooseneck stand. You manipulate the stick in your mouth to move the cursor while your tongue presses down on a button on top of the stick for clicking. An image of the keyboard appears on the bottom of the screen. Users can select letters and carry out most keyboard functions. Extremely sensitive. $350. McIntyre Computer Systems, 22809 Shagbark, Birmingham, MI 48010. (313) 645-5090. (Oct '89)

MouseStick ‡‡‡‡½

The MouseStick is useful where precise definition of movement is needed. The joystick has programmable settings; buttons can be programmed to carry out mouse-type functions or execute keyboard commands with single-, double-, or triple-clicking. $129.95. Advanced Gravis Computer Technology, 7033 Antrim Ave., Burnaby, British Columbia V5J 4M5, Canada. (800) 663-8558 or (604) 434-7274. (Oct '89)

MouseTouch ‡‡‡‡

The MouseTouch is a touch screen for selecting screens, pulling down menus, and entering numeric information via an on-screen keypad. Can be installed by the user. $1,060. Information Strategies, 888 S. Greenville Ave., Suite 121, Richardson, TX 75081. (214) 234-0176. (Oct '89)

PC Scan 2000 ‡‡‡‡½

The PC Scan 2000 is an 8-bit scanner that saves images in up to 256 levels of gray. Can be configured for PCs. Requires 1 megabyte. Scanner, $1,395; Publish Pac software, $395; OCR text-processor card, $795. New Dest, 1015 E. Brokaw Road, San Jose, CA 95131. (408) 436-2700. (Dec '88)

ProPoint ‡‡‡½

The ProPoint has a click button and a small lock button on the lower left side of the trackball casing. Left-handed people may have to take their fingers off the ball to press the buttons. $140. Abaton Technology, 48431 Milmont Drive, Fremont, CA 94538. (415) 683-2226. (Oct '89)

PW10SL ‡‡‡‡½

The PW10SL is a drawing tablet that offers friendly software setup and easy macro programming. Basic system menu commands, a mousing area, software controls, a macro pad, and a small keyboard appear along one side. Click-and-drag scaling and moving of the drawing area. $799. Personal Writer, 1900 Avenue of the Stars, Suite 2817, Los Angeles, CA 90067. (800) 322-4744 or (213) 556-1001. (Oct '89)

ThunderScan ‡‡‡‡

The ThunderScan was the original Mac scanner. It still does the job, albeit very slowly. Can scan only materials that can be fed through the printer (it replaces the ribbon cartridge). Excellent software. Version 5.1. Requires Mac Plus or later and ImageWriter or ImageWriter II. $249. Thunderware, 21 Orinda Way, Orinda, CA 94563. (415) 254-6581. (Mar '90)

Turbo Mouse ADB ‡‡‡‡‡

The Turbo Mouse ADB is a trackball that is a favorite mouse replacement. Mousing and locking functions can be reversed for left-handed people. Has a "chording" feature for a user-specified keyboard-command-equivalent function. $169.95. Kensington Microware Ltd., 251 Park Ave. S., New York, NY 10010. (800) 535-4242 or (212) 475-5200. (Oct '89)

Wacom SD-510 Cordless Digitizer ‡‡‡‡‡

The SD-510 Cordless Digitizer is light and very thin. It uses a pressure-sensitive stylus that requires neither a cord nor a battery. The tablet connects to the modem port. Its sensing area is 6 x 9 inches (overall size is roughly 10 x 13 inches). The resolution is 770 lpi (lines per inch) at high accuracy. It's much more responsive than a mouse. When not in use, it makes an excellent mouse pad. $495. Wacom, W. 115 Century Road, Paramus, NJ 07652. (201) 265-4226. (June '90)

Wrist Mac ‡‡‡‡½

The Wrist Mac is a small watch that hooks to your Mac. You can download and retrieve up to 80 screens of 12 characters each. Options allow two-way communications. Versions with straps are available. And it's a decent watch. Version 1.2. Requires Mac Plus or later and HyperCard. $260. Microseeds, 7030-B W. Hillsborough Ave., Tampa, FL 33634. (813) 882-8635. (Dec '89)

•OUTPUT DEVICES

ColorPro Plotter ‡‡‡

The ColorPro Plotter is an eight-pen desktop plotter that requires third-party software to drive it. Its fonts are limited to an optional Graphics Enhancement Cartridge that requires some BASIC programming. $1,295. Hewlett-Packard, 19310 Pruneridge Ave., Cupertino, CA 95014. (800) 752-0900. (Feb '88)

ColorQuick ‡‡‡‡

The ColorQuick is a QuickDraw printer that has reasonable (216 dpi) quality and produces vivid colors. The color range is excellent. It's fast and offers hand, roll, and cut-sheet paper feeds. $2,345. Tektronix Graphics Printing Division, Wilsonville, OR 97070. (800) 835-6100. (May '90)

CrystalPrint Publisher ‡‡‡‡½

The CrystalPrint Publisher is the first 300-dpi PostScript-clone printer. Based on a RISC microprocessor, it's faster and cheaper than the LaserWriter IINT. While output quality is excellent, it can't handle Adobe fonts. No manual feed or envelope capabilities. $4,499. Qume Corp., 500 Yosemite Drive, Milpitas, CA 95035. (800) 223-2479 or (408) 942-4000. (Sept '89) ★'88 Eddy

DeskWriter ‡‡‡‡‡

The DeskWriter is HP's Mac-only version of the DeskJet inkjet printer, which swept the DOS world. Now built-in AppleTalk makes it more versatile. Although it can't do overheads and the ink can smear, its speed is excellent and text quality is equal to that of any 300-dpi laser printer. Uses QuickDraw, not PostScript, for graphics. Requires special fonts. Driver version A.02.00. $1,195. Hewlett-Packard, 19310 Pruneridge Ave., Cupertino, CA 95014. (800) 752-0900 or (800) 387-3867 (in Canada). (Apr '90)

Diconix M150 Plus Printer ‡‡‡‡

Diconix M150 Plus Printer is the latest version of the tiny inkjet printer that GCC Technologies ships as the WriteMove. It can run on batteries or AC and easily fits in a briefcase. Comes with ATM. A good choice if you're on the road. $699. Eastman Kodak Co., PPP Customer Information Center, 901 Elm Grove Road, Rochester, NY 14653-6224. (800) 344-0006. (Sept '90)

LabelWriter ‡‡‡‡

The LabelWriter is a small serial printer that thermally prints labels individually. Labels can include bar codes but can't mix text and graphics. The interface needs some work, and a Chooser-selectable driver is promised for future versions. This is an addicting and time-saving device. Comes with two Casady & Greene fonts. Requires Mac Plus or later. $249.95. CoStar, 22 Bridge St., Greenwich, CT 06830. (800) 426-7827 or (203) 661-9700. (May '90)

LaserWriter IINT ‡‡‡

The LaserWriter IINT is Apple's midpriced PostScript laser printer. It's faster than the LaserWriter Plus, with blacker blacks. Gray scale is less than that of the Plus. Requires Mac 512K or later. $4,499. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (May '88)

LaserWriter IINTX ‡‡‡‡½

The LaserWriter IINTX is Apple's top-of-the-line PostScript laser printer. The 68020 chip makes it very speedy; expandable to 12 megabytes; SCSI hard-disk drive can be attached for fonts. Requires Mac 512K or later. $5,999. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (May '88)

LaserWriter IISC ‡‡‡

The LaserWriter IISC is Apple's low-end QuickDraw laser printer. Can be upgraded to IINT or IINTX; reasonably fast. Requires Mac Plus or later. $2,799. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (May '88)

MacDot-LQ ‡½

The MacDot-LQ is a 24-pin dot-matrix printer that emulates the ImageWriter LQ. It uses the LQ driver for compatibility, but it's not networkable and costs nearly $200 more. Bug-ridden emulation often loses touch with your Mac. Requires ImageWriter II or LQ drivers' jumbo fonts for 216-dpi printing. $1,395. Advanced Matrix Technology, 765 Flynn Road, Camarillo, CA 93012. (800) 992-2264. (Aug '89)

PaintJet XL ⯪⯪⯪½
The PaintJet XL has low-resolution QuickDraw (180-dpi) quality but produces fast, good-looking output. Not all colors can be reproduced. Paper handling is good, and it can print B-size sheets. $2,495. Hewlett-Packard, 19310 Pruneridge Ave., Cupertino, CA 95014. (800) 752-0900. (May '90)

PLP II ⯪⯪⯪⯪⯪
The PLP II is a bargain-priced 300-dpi QuickDraw laser printer. Excellent printing performance, although a bit slow. No PostScript support. Requires Mac Plus or later. $1,399. GCC Technologies, 580 Winter St., Waltham, MA 02154. (617) 890-0880. (Mar '90) ★'89 Eddy

QMS Colorscript 100 ⯪⯪⯪⯪
QMS Colorscript 100 is the first color PostScript printer that uses a four-color thermal wax-transfer technology. Works on AppleTalk. Excellent typographic capability. Currently supports only a handful of applications. Requires Mac Plus or later. $21,995; Model 30, $15,995; Model 10, $9,995. QMS Electronic Publishing Group, One Magnum Pass, Mobile, AL 36689. (205) 633-4500. (Oct '88) ★'89 Eddy

QMS-PS 820 turbo ⯪⯪⯪⯪
The QMS-PS 820 turbo is a good substitute for the LaserWriter NTX. It is slightly faster and slightly cheaper than the NTX. It also has two paper trays, each capable of holding 200 sheets. The 820 uses a Canon TX engine. A hard-disk drive can be attached for fonts. $6,995. QMS Electronic Publishing Group, One Magnum Pass, Mobile, AL 36689. (800) 631-2692, ext. 420. (May '90)

QMS-PS810 ⯪⯪⯪½
The QMS-PS810 is an eight-page-per-minute 300-dpi PostScript laser printer that competes with the LaserWriter IINT. Comes with 2 megabytes of RAM standard; upgradable to 3 megabytes. Emulates HP LaserJet, 7475 (HPGL), and Diablo 630. $4,995. QMS Electronic Publishing Group, 7852 Schillinger Park W., Mobile, AL 36608. (800) 523-2696. (July '88)

Smart Label Printer ⯪⯪⯪⯪
The Smart Label Printer is a small serial printer that thermally prints labels one at a time. Labels can include bar codes but can't mix text and graphics. The interface needs some work. Requires Mac Plus or later. $249.95. Seiko Instruments USA, PC Products Div., 1144 Ringwood Court, San Jose, CA 95131. (800) 888-0817, ext. 104R, or (408) 922-5900. (May '90)

Tektronix 4693D Color Image Printer ⯪⯪⯪⯪
The Tektronix 4693D Color Image Printer is a 300-dpi bit-mapped color printer. Colors look smooth and rich. Uses bit-mapped screen fonts; most type has noticeable jaggies. Requires Mac II with color monitor. Recommended 8-megabyte configuration, $8,995. Tektronix, P.O. Box 1000, MS-63583, Wilsonville, OR 97077. (800) 835-6100. (Oct '88)

WriteImpact ⯪⯪⯪⯪
The WriteImpact is a near-letter-quality dot-matrix printer. It has 25-to-400 percent enlargement and reduction, print preview, smoothing, and kerning features. It uses special Bitstream fonts that tend to be large but also work well with ATM. Performance is very good — equaling that of the ImageWriter LQ without the problems and the high price tag. $699. GCC Technologies, 580 Winter St., Waltham, MA 02154. (617) 890-0880. (June '90)

WriteMove ⯪⯪⯪
The WriteMove is one of the smallest, lightest Mac printers. It's an inkjet unit that can produce resolutions of up to 192 dpi. It can run off rechargeable batteries or AC and weighs just 3 pounds. It comes with a good selection of Bitstream fonts. Printing quality varies widely, depending on the paper and ink used. Printer driver, version 1.0. Requires Mac Plus or later and hard-disk drive. $599. GCC Technologies, 580 Winter St., Waltham, MA 02154. (617) 890-0880. (Apr '89)

MULTIMEDIA

Business Simulator ⯪⯪⯪⯪
Business Simulator is a simulation-game training tool. You have to manage a company through several stages during 25 years and decisions become more difficult over time. Version 2.0. Requires Mac Plus or later. Can run from a hard-disk drive. $69.95. Strategic Management Group, 3624 Market St., Philadelphia, PA 19104. (215) 387-4000. (Dec '87)

ColorSpace IIi/FX ⯪⯪⯪⯪
ColorSpace IIi/FX brings live 24-bit video to the Mac. The FX board converts regular TV signals so they can be displayed on the Mac. It also offers sophisticated special effects. The Digitizer DA grabs frames for export. The IIi lets you mix live video with computer graphics. Requires Mac II or later. IIi, $2,299; FX, $3,499. Mass Microsystems, 550 Del Rey Ave., Sunnyvale, CA 94086. (800) 522-7979 or (408) 522-1200. (Mar '90) ★'88 Eddy

MacRecorder ⯪⯪⯪⯪½
MacRecorder is an audio digitizer for adding sounds to your Mac, animations, or HyperCard stacks. Supports an extensive array of audio-manipulation effects. HyperSound Toolkit makes adding sounds to HyperCard stacks easy. Version 2.0. Requires Mac Plus or later; HyperSound requires HyperCard version 1.2.1 or later. $249. Farallon Computing, 2000 Powell St., Suite 600, Emeryville, CA 94608. (415) 596-9100. (Jan '90)

MacroMind Director ⯪⯪⯪⯪⯪
MacroMind Director is the best tool for creating color and black-and-white presentations. Its object-oriented animation capabilities provide numerous editing features. Allows MIDI input. Version 1.0.1. Requires Mac Plus or later and 2 megabytes for color. $695. MacroMind, 410 Townsend St., Suite 408, San Francisco, CA 94107. (415) 442-0200. (Sept '89) ★'89 Eddy

ScreenRecorder ⯪⯪⯪⯪½
ScreenRecorder is a utility for recording your on-screen Mac activities. Ideal for presentations and training. Uses a tape-recorder model. "Tapes" can include sounds recorded with applications such as MacRecorder and can be a fixed length or loop. Recordings can be installed into HyperCard stacks for easier distribution. Version 1.0. Requires Mac Plus or later. $195. Farallon Computing, 2000 Powell St., Suite 600, Emeryville, CA 94608. (415) 596-9100. (June '89)

ShowCase F/X ⯪⯪⯪½
ShowCase F/X is an animated-titling package that provides several textual effects, including Aegis' own Poly fonts, to use for making title sequences. Provides a good introduction to tweening and frame-by-frame animation. Version 1.0. Requires color Mac II and 2 megabytes. $395. Aegis Development, 2210 Wilshire Blvd., Suite 277, Santa Monica, CA 90403. (800) 345-9871 or (213) 392-9972. (Dec '89)

TV Producer Pro ⯪⯪⯪
The TV Producer Pro is a NuBus card that overlays Mac graphics and text onto a video signal. Software is clumsy to use. Requires Mac II, Apple video card, and video source. $999. Computer Friends, Inc., 14250 N.W. Science Park Drive, Portland, OR 97229. (503) 626-2291. (May '88)

VideoWorks II Accelerator ⯪⯪⯪⯪
The VideoWorks II Accelerator compiles VideoWorks II movies to make them run more smoothly. Compensates for the QuickDraw screen display. Version 1.0. Requires Mac Plus or later and VideoWorks II; hard-disk drive recommended. $195. MacroMind, 410 Townsend St., Suite 408, San Francisco, CA 94107. (415) 442-0200. (Dec '88)

VideoWorks II Clip Animation ⯪⯪⯪⯪
VideoWorks II Clip Animation's Clip Charts, Black and White Movies, and Clip Sounds are separate aids to help you construct movies and business presentations. Requires VideoWorks II. $49.95 to $59.95. MacroMind, 410 Townsend St., Suite 408, San Francisco, CA 94107. (415) 442-0200. (Aug '88)

MUSIC

Alchemy ⯪⯪⯪⯪⯪
Alchemy loads and edits digitally sampled sounds from most commercial samplers. Version 2.0. Requires Mac Plus or later, MIDI or RS-422 interface, and sampler. $695. Passport Designs, Inc., 625 Miramontes, Half Moon Bay, CA 94019. (415) 726-0280. CP (Oct '88) ★'88 Eddy

Apple MIDI Interface ⯪⯪⯪
The Apple MIDI Interface is a simple musical-instrument digital interface with a 1-megahertz clock rate. Has only one MIDI input and one output. Works with all Macs; adapter required for 128K and 512K. $99. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (June '88)

ConcertWare+ ⯪⯪⯪⯪
ConcertWare+ is an enhanced version of ConcertWare. Has different instruments and can use any four of a set of eight at any point in a piece. Supports Adobe Sonata music font. Version 5.0. $69.95. Great Wave Software, 5353 Scotts Valley Drive, Scotts Valley, CA 95066. (408) 438-1990. (Dec '87) ★'85 Eddy

ConcertWare+MIDI ⯪⯪⯪⯪
ConcertWare+MIDI is a composition and transcription program that can record multiple notes from a MIDI keyboard. Easy to use if you read music. Handles eight tracks of eight voices each. Version 5.1. Requires Mac 512K or later. $189.95. Great Wave Software, 5353 Scotts Valley Drive, Scotts Valley, CA 95066. (408) 438-1990. (Dec '87)

Cue: The Film Music System ⯪⯪⯪⯪½
Cue: The Film Music System is a powerful and versatile assistant for scoring films. Automates spotting and logging cue points and searching for matching tempos. Also performs many minor jobs, such as generating a performing-rights cue sheet. Version 3.0. Requires Mac 512KE or later. $595. Opcode Systems, 3641 Haven Drive, Suite A, Menlo Park, CA 94025-1010. (415) 369-8131. CP (Feb '89)

Deluxe Music Construction Set ⯪⯪⯪⯪
Deluxe Music Construction Set lets you enter up to 48 voices on eight staves and play the music through the Mac's internal speaker and/or via MIDI.

Version 2.5. Requires Mac Plus or later. $129.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. (800) 245-4525 or (415) 571-7171. CP (June '88)

Encore ♪♪♪♪½

Encore is quasi-rule-based music-notation program with a very nice interface. It supports multiple files and can deal with large scores. Version 1.3. Requires Mac Plus or later. $595. Passport Designs, 625 Miramontes St., Half Moon Bay, CA 94019. (415) 726-0280. (May '90)

Finale 2.0 ♪♪♪♪½

Finale 2.0 is the upgraded version of a complex, revolutionary music-notation program. Finale packs power and a much-improved interface and manuals. It's best suited to users needing absolute control over all the music elements in large-scale compositional and/or publishing projects. Version 2.0. Requires Mac Plus, hard-disk drive, MIDI instrument and interface, and PostScript printer. $749. Coda Music Software, 1401 E. 79th St., Minneapolis, MN 55425-1126. (800) 843-1337 or (612) 854-1288. (May '90)

Harmony Grid ♪♪♪♪½

Harmony Grid offers an experiential approach to harmony theory. Users are presented with a grid, so they can see scales and chords as repeating patterns. They play these tones by moving the mouse over the grid, resulting in improvisation without requiring any training or technique. The program automatically provides counterpoint as well. Supports MIDI. Version 1.05. $99. Hip Software, 117 Harvard St., Suite 3, Cambridge, MA 02139. (617) 661-2447. (Aug '90)

Jam Session ♪♪♪♪

Jam Session is a music program for those who think MIDI refers to the length of skirts. Without any skill, you can "jam" with rock, jazz, rap, or country tunes. A sort of "Sing Along with Mitch" for the computer set. Requires Mac 512K or later. $49.95. Brøderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101. (415) 492-3200. CP (July '88)

Master Tracks Pro ♪♪♪♪½

Master Tracks Pro is a full-featured second-generation MIDI sequencer that adheres to the Mac interface very well. It's the first program to have graphics-controller editing. Version 4. Requires Mac 512KE or later. $495. Passport Designs, 625 Miramontes St., #103, Half Moon Bay, CA 94019. (415) 726-0280. CP (Dec '87)

MIDIBASIC ♪♪♪♪

MIDIBASIC is a simple but highly useful routine for writing MIDI software. Good stuff. Sketchy documentation. Works with both Microsoft BASIC and ZBASIC. Version 3.0. Requires Mac 512K plus BASIC. $99.95. Altech Systems, 831 Kings Highway, Suite 200, Shreveport, LA 71104. (318) 226-1702. (Aug '87)

Music Mouse ♪♪♪♪♪

Music Mouse is a music program in a genre all its own. Called an intelligent instrument, Music Mouse gives you instant musical feedback as you move the mouse and type on the keyboard, which controls tempo, vibrato, volume, and so on. Version 2.02. $79.95. Dr. T's Music Software, 220 Boyiston St., Suite 206, Chestnut Hill, MA 02167. (617) 244-6954. (May '87)

MusicProse ♪♪♪♪

MusicProse, a subset of Finale 2.0, was designed specifically for preparing lead sheets, piano-vocal parts, and small ensemble scores. It's relatively easy to learn and is a very good performer. Version 1.0. Requires Mac Plus or later. $249. Coda Music Software, 1401 E. 79th St., Minneapolis, MN 55425-1126. (800) 843-1337 or (612) 854-1288. (May '90)

Perceive ♪♪♪♪

Perceive is a multipart music-training package. Generally effective tools train the ear. Not all parts are equally good. Requires any Mac. $99. Coda Music Software, 1401 E. 79th St., Minneapolis, MN 55425. (800) 843-1337 or (612) 854-1228. (Mar '90)

Performer ♪♪♪♪

Performer is a full-featured MIDI sequencer that includes looping, SMPTE synching, 32 simultaneous Ins and Outs, unlimited overdubbing, and compatibility with Professional Composer for transcription. Version 3.4. Requires Mac 512K or later and MIDI interface. $495. Mark of the Unicorn, 222 Third St., Cambridge, MA 02142. (617) 576-2760. CP (Jan '88)

Practica Musica ♪♪♪♪♪

Practica Musica is a classic-harmony course taught as a series of 11 activities that are presented as games. Topics include simple pitch reading and writing, scales, modes, interval recognition, chord spelling, and ear training. Supports MIDI. Version 2.2. $125. Ars Nova Software, P.O. Box 637, Kirkland, WA 98083. (800) 445-4866. (Aug '90)

Professional Composer ♪♪♪½

Professional Composer produces performance-quality sheet music using Adobe's Sonata font. Scores can be created from scratch or imported from Performer (and can be exported to Performer for MIDI playback). Version 2.3. Requires Mac 512K or later. $495. Mark of the Unicorn, 222 Third St., Cambridge, MA 02142. (617) 576-2760. CP (Jan '88)

Sound Designer ♪♪♪♪

Sound Designer set the standard for editing samples on lower-cost samplers, but it still lacks real-time high-fidelity playback. Requires Mac 512K or later, sampler, and MIDI interface. Emax, EII, 2000/2002, DSS-1, S900, $495; all others, $395; Sound Designer Universal, version 1.5, $395; Sound Designer II, version 1.03, $995. Digidesign, 1360 Willow Road, Suite 101, Menlo Park, CA 94025. (415) 688-0600. CP (Oct '88)

Studio Session ♪♪♪♪½

Studio Session consists of two programs — Editor and Player — that produce music with six voices of digitized sound. Excellent program and manual make this a good buy. $89.95. Bogas Productions, 1520 Pacific Ave., San Francisco, CA 94109. (415) 673-2532. (Aug '87) ★'86 Eddy

Turbosynth ♪♪♪♪♪

Turbosynth creates sounds for a digital sampler using modular-synthesis techniques. Good harmonic spectral inverter. Lacks an easy method of multisampling. Version 2.0. Requires Mac Plus or later, sampler, and MIDI interface. $349. Digidesign, 1360 Willow Road, Suite 101, Menlo Park, CA 94025. (415) 688-0600. CP (Oct '88)

UpBeat ♪♪♪½

UpBeat turns the Mac into a front panel for a highly complex and versatile drum machine. Input patterns with mouse, MIDI keyboard, or drum machine. Version 2.0. Requires Mac 512K or later. $249. Intelligent Music, 116 N. Lake Ave., Albany, NY 12206. (518) 434-4110. CP (May '88)

Vision ♪♪♪♪½

Vision sets a new standard in Mac sequencers. Supports full SMPTE control, event-list and graphics editing; real-time and step recording; looping; tempo, meter, and dynamic changes; and standard MIDI files. MIDI Keys maps certain Mac keyboard commands to your MIDI controller. Faders window supports 32 faders offering real-time control of volume, tempo, and synthesizer-specific functions. Version 1.1. Requires Mac Plus or later, MIDI interface, and MIDI synthesizer. $495. Opcode Systems, 3641 Haven Drive, Suite A, Menlo Park, CA 94025-1010. (415) 369-8131. CP (Dec '89)

ORGANIZATIONAL TOOLS

The Microsoft Office ♪♪♪♪½

The Microsoft Office is Word, Excel, Mail, and PowerPoint on a CD-ROM disc (a floppy disk version is also available). A full set of Adobe screen fonts, a copy of DocuComp, Excel templates, lots of clip-art samples, and other Microsoft applications are included. A HyperCard stack controls everything and there's comprehensive on-line HyperCard documentation. Businesses just getting started will find this package a bargain. Requires Mac Plus or later; CD-ROM drive. $949. Microsoft Corp., One Microsoft Way, Redmond, WA 98052-6399. (206) 882-8080. (Apr '90)

Writer's Dreamtools ♪♪♪♪½

Writer's Dreamtools is a set of three HyperCard stacks that can be extremely useful. It comes in G- and X-rated versions. The clichés and catchphrases stacks are fascinating. There's also a thorough Slang stack. Requires HyperCard and a hard-disk drive to print. Complete set, $79; $35 each. Slippery Disks, P.O. Box 1126, Los Angeles, CA 90069. (800) 522-7234 or (213) 274-3600. (May '90)

• OUTLINERS

Acta Advantage ♪♪♪♪½

Acta Advantage is an outliner application. Also comes with the Acta DA. Smart Paste lets you paste material from other applications into Acta outline format. Includes drivers for translating Acta outlines into MORE and ThinkTank (both ways) and into MacWrite, WriteNow, Works, and RTF files. DA, version 3.01; application, version 1.03. Requires Mac 512KE or later. $129. Symmetry, 8603 E. Royal Palm, Suite 110, Scottsdale, AZ 85258. (800) 624-2485. (Aug '89) ★'89 Eddy

IdeaFisher ♪♪♪♪

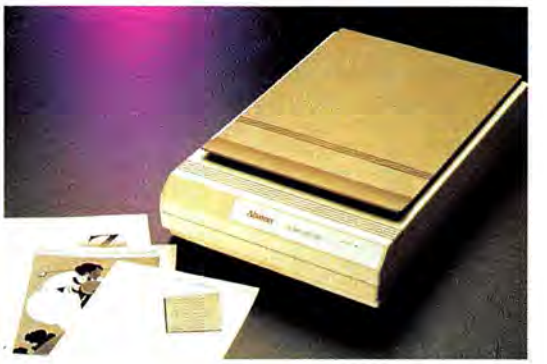
IdeaFisher is a thought processor that's based on an eight-disk, more than 7-megabyte database of words, phrases, clichés, and titles. The database is cross-referenced and indexed in several ways. Useful search techniques are provided and your "conclusions" are held in a separate file. It's text-based, so it's fairly quick, but it's not attractive. The filters are unsophisticated, giving equal weight to everything. Requires Mac Plus or later. $495. Fisher Idea Systems, 18881 Von Karman Ave., Irvine, CA 92715. (714) 474-8111. (May '90)

MORE II ♪♪♪♪♪

MORE II is an outlining and organizational tool that is an improvement over its predecessors, MORE and ThinkTank. MORE II has on-screen capabilities well beyond its competitors', especially in a multimonitor setup. Version 2.01. Requires Mac Plus or later, System 4.1 or later, and a

Abaton Scan 300/GS

Abaton Scan 300/GS is a 300 dpi, 8-bit scanner that offers 256 levels of true gray-scale scanning. It supports line art, halftone, and gray-scale scanning modes as well as mirroring and inverting scanned images. The flatbes design of the *Scan 300/GS* facilitates accurate alignment of documents up to 8.5" x 14", while the removable lid allows scanning of oversized drawing and maps. It has 255 brightness settings and 255 contrast settings for adjusting the scan of a dark or light original. Abaton Scan DA is shipped with the scanner to allow users to scan images from within any Macintosh application without exiting the current program.



System Requirements
Macintosh—IIcx, IIx, SE/30, SE or Plus
PC—IMB PC, XT, AT, PS/2 or compatible

Price
$1595 for scanner
$295 for PC or Mac interface kit

Support
90-day on-site maintenance service;
extended warranty available upon request

Abaton Technology Corp.
48431 Milmont Drive
Fremont, CA 94538
(800) 444-5321



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The high-performance Macintosh/UNIX network

uShare networks Macintoshes to high-performance UNIX hosts. Besides sharing files and resources, Macintosh users enjoy large and inexpensive disk capacity and greater processing power. In addition to standard UNIX features and utilities, uShare provides its own electronic mail, remote system disks, and print spooling.

uShare complies fully with Apple's data communications protocols as well as with TCP/IP protocols. It is completely compatible with AppleShare and with AppleTalk Phases 1 and 2.

uShare works with Macintoshes on LocalTalk and Ethernet and is available for UNIX machines from a dozen manufacturers.

Information Presentation Technologies, Inc. (IPT)

5000 N. Parkway Calabasas
Calabasas, CA 91302

(818) 347-7791
FAX (818) 992-5580
(800) 233-9993

hard-disk drive. $395. Symantec, Living Videotext Division, 10201 Torre Ave., Cupertino, CA 95014. (408) 253-9600. (May '89)

• PERSONAL-INFORMATION MANAGERS

Address Book Plus ★★★★½

Address Book Plus is a very nice name-and-address manager. It prints only on one side of a page, but it has all the other features you might need. Its sorting and import/export abilities are good. A limited DA allows file access from other applications. Version 1.0. Requires System 6.0.2 or later. $89.95; with leather binder, $129.95. Power Up Software, 2929 Campus Drive, San Mateo, CA 94403. (415) 345-5900. (Apr '90)

DynoDex ★★★★

DynoDex is an address-book program. Comes with a nice binder to hold your printouts. Has the ability to print on both sides of the paper. Special paper to fit Filofax binders is included. Nice work, but needs a DA to access data while you're in other applications. Version 1.01. Requires Mac Plus or later. $149.95. Portfolio Systems, 158 Flushing Ave., Brooklyn, NY 11205. (800) 729-3966. (Feb '90)

FamilyCare ★★★

FamilyCare is a handbook of childhood diseases. The rule-based expert system gives advice based on symptoms. Ailments and diseases run the gamut from acne and appendicitis to wheezing and yeast infections. Lacks graphics. Version 1.05. Requires Mac 512K or later. $59.95. Lundin Laboratories, Inc., 29451 Greenfield Road, Suite 216, Southfield, MI 48076. (313) 559-4561. (Sept '88)

For the Record ★★★★

For the Record is a database designed for legal, financial, and personal records. Allows password locking of screens containing sensitive personal data. Version 1.0. Requires Macintosh 512KE. $49.95. Nolo Press, 950 Parker St., Berkeley, CA 94710. (415) 549-1976. (Feb '89)

Front Desk MultiUser ★★★½

Front Desk MultiUser is a schedule and resource manager best suited for small professional offices. Can be used in a networked multiuser environment. Basic functionality but simple and capable. Version 6.10. Requires Mac 512KE and System 5.0 or later (single user); Mac Plus and System 5.0 or later (multiuser). Single user, $99; 2 to 5 users, $75 each; 6 to 10 users, $60 each; 11 or more users, $40 each. Layered, The Schrafft Center, 529 Main St., Boston, MA 02129. (617) 242-7700. (Jan '90)

MacPhonebook ★★★½

MacPhonebook handles name-and-address lists with up to 1,600 entries. Its forte is printing lists in large, medium, and small (Little Black Book) formats. Version 1.0. Requires Mac 512K or later. $79.95. Synex, 692 Tenth St., Brooklyn, NY 11215. (718) 499-6293. (Oct '89)

My Time Manager ★★★½

My Time Manager is a complete HyperCard-based organizer with a full range of nicely implemented tools including an appointment book, an address and phone book, a notes and contacts area, and a dialer. Only daily and monthly reports are available for printing. Its performance is good and the publisher support is excellent. Version 2.0. Requires Mac Plus or later and HyperCard. $79.95. MacShack Enterprises, 19 Harrington Road, Cambridge, MA 02140. (617) 876-6343. (Apr '90)

QuickDEX ★★★★½

QuickDEX keeps your telephone numbers in an electronic Rolodex DA. Can dial phones easily. Version 1.4a. Requires Mac 512KE or later; hard-disk drive recommended. $60. Casady & Greene, P.O. Box 223779, Carmel, CA 93922. (408) 624-8716. (Jan '89)

Remember? ★★★★

Remember? is a nice shareware INIT that lets your Mac remind you of important items. Every time you start up, if you've entered a note for the day via Remember?'s DA, it presents a window with the details. Its free-form occasion list is easy to maintain. The DA also lets you check your calendar in advance. Implementation is clean. Version 1.3. Shareware: $10. David Warker, 1330 W. North St., Egg Harbor, NJ 08215-1763. (July '90)

Take Control of Cholesterol ★★★½

Take Control of Cholesterol is one of a series of health- and food-related programs. It's clearly a port from a simpler interface, but in spite of that, it's a good tool. It's designed to be used with *Eater's Choice*, a book that tells you how to reduce cholesterol by lowering your saturated-fat intake. The program sets up worksheets and lets you fill out meal plans. Version 2.0. $39.95. Lifestyle Software Group, 63 Orange St., St. Augustine, FL 32084. (800) 289-1157 or (904) 825-0220. (Aug '90)

WillMaker ★★★½

WillMaker is a simple yet valuable run-time BASIC program for creating wills. Although it's not elegant, it does the job well. Version 3.0. $59.95. Nolo Press, 950 Parker St., Berkeley, CA 94710. (415) 549-1976. (Mar '89)



UTILITIES

After Dark ★★★★½

After Dark is the excellent screen saver that introduced the concept of modules. A steady stream of interesting modules, including Puzzle, have been released. Although the first version had some minor bugs, the current version is fine. Version 1.01. Requires Mac 512KE or later. $39.95. Berkeley Systems, Inc., 1700 Shattuck Ave., Berkeley, CA 94709. (415) 540-5535. (Apr '90)

Anti-Virus Kit ★★★½

Anti-Virus Kit is an antivirus utility that comes in three parts: an alert INIT, an application that installs a history file on any disk that records changes to that disk, and an application that helps identify the time an infection occurred. Doesn't have repair capabilities. Version 1.0. Requires Mac 512KE and System 4.1. $79.95. 1stAid Software, 42 Radnor Road, Boston, MA 02135. (617) 782-4676. (Oct '89)

AutoSave 2 ★★★

AutoSave 2 provides insurance against system crashes. It saves your work automatically at intervals from 1 to 99 minutes. Compatible with many applications but not recommended for use with databases. Version 1.1. $49.95. Magic Software, 12206 Franklin St., Bellevue, NE 68005. (800) 342-6243. (Dec '89)

Calculator Construction Set ★★★★

Calculator Construction Set allows you to build almost any sort of calculator imaginable. The finished calculators are real working DAs. Although it requires some effort, and you'll need to read the manual, the results are worth it. Version 2.06. Requires any Macintosh. $89.95. Dubl-Click Software, 9316 Deering Ave., Chatsworth, CA 91311. (818) 700-9525. (Feb '90)

CalendarMaker ★★★★

CalendarMaker is a utility that creates a variety of calendars. Many people use it to create personal calendars. Excellent printing routines. Version 3.3. Requires Macintosh 512K or later and System 4.1 or later. $49.95. CE Software, P.O. Box 65580, West Des Moines, IA 50265. (515) 224-1995. (Sept '89)

Comment ★★★★

Comment is an electronic version of Post-it notes. A mini word processor lets you attach notes to a spreadsheet cell, to words in a text document, or to a window on the desktop. Version 2.2. Requires Mac 512KE or later. $99.95. Deneba Software, 3305 N.W. 74th Ave., Miami, FL 33122. (305) 594-6965. (Dec '88)

Copy II Mac ★★★★

Copy II Mac is a collection of powerful yet easy-to-use disk utilities with disk-copying abilities and much more. Version 7.2. Requires Mac 512K or later. $39.95. Central Point Software, 15220 N.W. Greenbrier Parkway, #200, Beaverton, OR 97006. (503) 690-5162. (Mar '89)

Desktop Help for Excel ★★★★

Desktop Help for Excel is a DA that gives you context-sensitive help for Excel 2.2. It's much more extensive than Excel's own Help file. You won't be told to go look it up in the manual. Version 2.2. Requires Macintosh Plus or later. $79.95. Help Software, 10659A Maplewood Road, Cupertino, CA 95014. (408) 257-3815. (Mar '90)

DiskExpress ★★★★★

DiskExpress optimizes hard-disk-drive performance by reorganizing fragmented files. Best of its kind. Version 1.5. Requires Mac 512K. $89.95. ALSoft, Inc., P.O. Box 927, Spring, TX 77383-0927. (713) 353-4090. (Jan '89)

Electric Dvorak ★★★★★

Electric Dvorak is the best Dvorak implementation for the Mac. The basic program is an installer that puts the small (3K or so) necessary resources into your System file. Once that's done, you can toggle between the standard key mapping and a Dvorak arrangement with a keyboard command equivalent. Either keyboard can be set as the default startup arrangement. The documentation, which is all electronic, is brief but excellent. A small chart of the Key-Caps layout is provided as well. Version 1.0. Free. Tom Phoenix, Box 265-ed, Portland, OR 97207-0265. (Aug '90)

Freedom of Press ★★★★

Freedom of Press lets you print PostScript-quality output on non-PostScript printers. Limited to LaserWriter Plus font set. Process is slow and creates large PostScript files, but output is nearly indistinguishable from true PostScript printer output. $495. Version 2.1a. Requires Mac SE/30 or II series and a hard-disk drive. Custom Applications, Building 8, 900 Technology Park Drive, Billerica, MA 01821. (800) 873-4367 or (508) 667-8585. (Jan '90) ★'89 Eddy

Hot Keys (MacWrite II version) ★★★½

Hot Keys (MacWrite II version) is a set of MacroMaker macros for MacWrite II (versions for Works and PageMaker are also available). Includes utility macro software and a keyboard overlay. Works well and contains many useful macros (some for the Finder too). Version 1.0. Requires System

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6.0.2 or later, MacroMaker (included), and extended keyboard. $44.95 per version. K.I.S.S. (Keep It Simple Software), 324 Fuller, Suite C-3, Helena, MT 59601. (406) 442-3559. (Jan '90)

Icon-It! ⚡⚡⚡⚡½

Icon-It! lets you create icons to use as alternatives to menu commands. Use its 100 icon templates, or create your own. Version 2.0. $89. Tactic Software, 13615 S.W. 128th St., Miami, FL 33186. (305) 378-4110. (Feb '88)

Image Grabber ⚡⚡⚡⚡½

Image Grabber is a DA screen-capture program that is like an improved version of the old Camera DA. Can capture pulled-down menus and convert 8- and 24-bit-color screens to 2-bit black-and-white files, which saves huge amounts of memory. Has real-time and delay modes and captures in MacPaint and PICT formats. Version 2.0. Requires Mac Plus or later; System 6.0.3 or later. $49. Sabastian Software, P.O. Box 70278, Bellevue, WA 98007. (206) 861-0602. (May '90)

Mail Rater ⚡⚡⚡⚡

Mail Rater is a large HyperCard stack that takes all the guesswork out of postage. It should pay for itself in a short time. Includes HyperCard. Version 1.01. Requires Mac Plus or later, HyperCard 1.2.2 or later, and a postage scale. $49.95. Tight Line Software, 27601 Forbes Road, Suite 50, Laguna Niguel, CA 92677. (714) 367-0007. (Feb '90)

MasterJuggler ⚡⚡⚡⚡⚡

MasterJuggler is Font/DA Juggler with so many features added that they can't be listed here. A world-class utility. Not as elegant as Suitcase II but has more features. Version 1.5. Requires Mac 512K or later. $89.95. ALSoft, Inc., P.O. Box 927, Spring, TX 77383-0927. (713) 353-4090. (Mar '89)

MathCAD ⚡⚡⚡⚡

MathCAD is a solid, if somewhat quirky, math processor for equation solvers. The program can also create charts, although its data-handling ability is somewhat limited for that use. Data entry needs to be improved and made more Mac-like. Version 2.02. Requires Mac Plus or later. $495. MathSoft, One Kendall Square, Cambridge, MA 02139. (800) 628-4223. (Apr '90)

MockPackage + Utilities ⚡⚡⚡⚡½

MockPackage + Utilities is a set of extremely powerful DAs. Includes a text editor, text printer (supports LaserWriter), charter, terminal, several other useful tools, and EZmenus. Version 4.4. $49.95. CE Software, P.O. Box 65580, West Des Moines, IA 50265. (515) 224-1995. (Mar '87)

Partner ⚡⚡⚡⚡½

Partner is an INIT that lets you use graphics-editing applications while using a DTP program such as MacWrite II, Word, PageMaker, QuarkXPress, MacDraw, MacDraw II, Illustrator, FreeHand, FreePaint, SuperPaint, and Canvas. Version 1.0. Requires Mac Plus or later. $99. Salient, 3101 Avalon Court, Palo Alto, CA 94306. (415) 852-9567. (May '90)

Pyro! ⚡⚡⚡⚡½

Pyro! is the premier Mac screen saver. All the required settings are found in the Control Panel. Current version features modules such as Aquarium and Flashlight. Version 4.0. Requires Mac 512K or later and System 6.0.2 or later. $39.95. Fifth Generation Systems, 10049 N. Reiger, Baton Rouge, LA 70809. (800) 873-4384. (Sept '89)

QuicKeys ⚡⚡⚡⚡

QuicKeys lets you make full use of your keyboard. Assign any command (menu choices, DAs, and so on) or series of text blocks and/or commands to any key or key combination. Enormously powerful; necessary for Apple Extended Keyboard owners. Version 1.2. Requires Mac 512K or later. $99.95. CE Software, P.O. Box 65580, West Des Moines, IA 50265. (515) 224-1995. (Jan '88) ★'87 Eddy

SAM (Symantec AntiVirus for Macintosh) ⚡⚡⚡⚡⚡

SAM (Symantec AntiVirus for Macintosh) version 2.0 is a clear step forward in virus protection. The most significant new feature is an easy upgrade procedure that lets users upgrade SAM to fight new viruses by calling Symantec's 24-hour Virus Newsline. The INIT portion, SAM Intercept, has been improved slightly, although its interface has suffered a bit in the process. Virus Clinic (the batch-checking application) now sports a better interface and some new power. Version 2.0. $99.95. Symantec, 10201 Torre Ave., Cupertino, CA 95014. (408) 253-9600. (Aug '90)

Screen Gems ⚡⚡⚡⚡

Screen Gems is a package of five color utilities for Macintosh II owners. Color Desk puts art onto your desktop, Dimmer dims the screen when the computer is inactive, and Switch-a-Roo lets users switch between any two color modes instantly. Globe is a neat demo, and TN-3 lets you customize the Finder's Color menu. Version 1.0. Requires Macintosh II with 2 megabytes, a color monitor, and System 4.2 or later. $79. Microseeds, 7030-B W. Hillsborough Ave., Tampa, FL 33634. (813) 882-8635. (Sept '89)

Stepping Out II ⚡⚡⚡⚡⚡

Stepping Out II is a software alternative to a large-screen monitor. Lets you create a virtual screen (as large as memory allows) inside the Mac's 9-inch screen. Automatically scrolls to new document position as you type or draw. Version 2.0. Requires Mac Plus or later. $95. Berkeley Systems, 1700 Shattuck Ave., Berkeley, CA 94709. (415) 540-5535. (Oct '88)

Suitcase II ⚡⚡⚡⚡⚡

Suitcase II is even better than its predecessor. Increased file-management capabilities let you open 99 font, DA, sound, or Fkey files at a time. Can display any installed font in any style. Fonts can also appear in their proper typefaces on the font menus. Includes Font Harmony for resolving font-ID conflicts, and Font & Sound Valet for font and sound compression. Version 1.2.6. Requires Mac 512KE or later. $79. Fifth Generation Systems, 10049 N. Reiger, Baton Rouge, LA 70809. (800) 873-4384. (June '89) ★'87 Eddy

SUM II ⚡⚡⚡⚡⚡

SUM II is an upgraded and expanded version of the essential SUM data-recovery utility. Includes utilities for partitioning, encrypting, backing up (based on Redux), and optimizing. None of these modules is preferable to the dedicated packages available, but they all work. The recovery module is still excellent and has a much improved interface. Version 2.0. Requires Mac Plus or later and System 4.2 or later. $149.95. Symantec, 10201 Torre Ave., Cupertino, CA 95014. (408) 253-9600. (Dec '89)

SuperGlue II ⚡⚡⚡⚡⚡

SuperGlue II is the newest and best print-to-disk program. Offers superior operation along with many nice touches, such as Glue Notes (Post-it-like notes) and One-Timer, an Fkey that makes operation immensely easier. Version 2.0.1. Requires Mac Plus or later, System 6.0 or later. $119.95. Solutions, Inc., 30 Commerce St., Williston, VT 05495. (802) 658-5506. (Nov '89)

Tablecloth ⚡⚡⚡

Tablecloth is a small package that makes using MultiFinder less confusing and far more pleasant. Hides all but the active window when you triple-click in the window. Version 1.0. Requires System 6.0.1 or later and MultiFinder 6.0.1. $49.95. User-Tek, 444 E. 66th St., Suite C, Tulsa, OK 74136. (800) 888-7640. (Oct '89)

Tempo II ⚡⚡⚡⚡½

Tempo II is a powerful keyboard macro program that gives owners of extended keyboards their money's worth. Quite good for building sequential macros. Features include conditional branching and the ability to remember menu selections by name. Version 1.02. $149.95. Affinity Microsystems Ltd., 1050 Walnut St., Suite 425, Boulder, CO 80302. (303) 442-4840. (Dec '88)

Tidy It Up! ⚡⚡⚡⚡½

Tidy It Up! goes into your cluttered System Folder and straightens things up visually. Where necessary, it creates dummy marker folders. Until System 7.0 eliminates the System Folder chaos, this is the way to keep track of everything in your System Folder. Version 1.0. Requires any Mac. Shareware fee, $15. Guy Fiems, 77 av. Leopold III, 1970 Wezembeek-Oppem, Belgium. Also available for download on Zmac and other on-line services. (May '90)

Virex ⚡⚡⚡⚡⚡

Virex is an excellent virus preventer, detector, and eradicator that works against known viruses and has an excellent support and update history. Version 2.5. Requires Mac Plus or later and System 5.0 or later. $99.95; annual update service, $75. Microcom Software/HJC, 3700-B Lyckan Parkway, Norwood, MA 02062. (919) 490-1277. (Jan '90)

Virtual 2.0 ⚡⚡⚡⚡⚡

Virtual can give you as many as 14 megabytes of effective RAM. Once you start using this program, you're hooked. Its excellent performance and superb support make using it a pleasure. Version 2.03. Requires Mac IIx or later, SE/30, or Mac II with optional 68851 PMMU. $199; with PMMU chip, $275. Connectix, 125 Constitution Drive, Menlo Park, CA 94025. (800) 950-5880 or (415) 324-0727. (Apr '90) ★'89 Eddy

Word Wrapper ⚡⚡⚡½

Word Wrapper is the sort of simple utility you find useful several times a day (if you telecommunicate much). Wraps or breaks Mac-created text files to a user-specified length and also adds line breaks (using some intelligence) to received text files. Requires Macintosh 512K or later. $39.95. International Technology Development Corp., 1653 Lombard St., San Francisco, CA 94123. (415) 929-0924. (Nov '89)

WorksPlus Command ⚡⚡⚡⚡

WorksPlus Command lets you build and define macros for all Works modules. Predefined macros provide for an even tighter integration of the program's word-processing spreadsheet and database modules. Version 2.0. Requires Mac Plus or later and Works. $149.95. Lundeen & Associates, P.O. Box 30038, Oakland, CA 94604. (800) 233-6851. (May '88)

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• Backup and File Recovery

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AutoBack creates copies of nonbacked-up data files on another hard disk (or on selected tape drives) whenever you save a file or activate AutoBack. Applications and System files are not backed up. You can set AutoBack to back up only selected files. Your options as to what to back up and what not to are a bit too limited. Performance is very good. Version 1.31. $99. Soft Trends, 2243 Pacific Ave., Suite B101, Costa Mesa, CA 92627. (714) 650-2158. (Aug '90)

Cat•Back ★★★½

Cat•Back combines disk cataloging and backup. The cataloger is as good as they come, but the backup portion needs some improvement. Backing up from one partition to another on the same drive crashed the program. Other backup performance was OK. Incremental (which Cat•Back calls archival) and mirror-image backups can be made. The interface and overall operational procedure need some polishing. Version 1.1. $39.95. Master Manufacturing, 118 N. Cypress St., La Habra, CA 90631. (213) 694-6861. (Aug '90)

Complete Undelete ★★★★★

Complete Undelete is a superb file-recovery program. Excellent interface, very fast, and capable of recovering even some partially overwritten files. It pays for itself very quickly. Get it. Version 1.0. Requires Mac 512KE or later and System 5.0 or later. $49.95. 1st Aid Software, 42 Radnor Road, Boston, MA 02135. (617) 782-4676. (Jan '90)

Fastback II ★★★★

Fastback II supports incremental and differential backups and offers users a choice of compression levels. Backup configurations can be saved as preference files. Macro language supports automated procedures. Nonstandard dialog boxes are occasionally unclear. Version 2.01. Requires Mac 512KE or later and System 4.2 or later. $189. Fifth Generation Systems, 10049 N. Reiger Road, Baton Rouge, LA 70809. (504) 291-7221. (Oct '89)

1stAid Kit ★★★★½

1stAid Kit recovers lost or damaged files from floppy or hard-disk drives. An excellent manual-turned-textbook that teaches HFS. Version 2.8. Requires Mac Plus or later. $99.95. 1stAid Software, 42 Radnor Road, Boston, MA 02135. (617) 783-7118. (June '88)

HFS Backup ★★★★

HFS Backup is a top-class backup program. Quick and reliable. Version 3.0. $99. Personal Computer Peripherals, 4710 Eisenhower Blvd., Building A4, Tampa, FL 33634. (813) 884-3092. (Oct '89)

Redux ★★★★½

Redux is an excellent incremental-backup program. Lets you back up files, folders, or entire volumes. You can write scripts, using the Redux control language, BackTalk. Comes with Redux Restore, a restore utility that can be distributed freely. Version 1.62. Requires Macintosh Plus or later. $99. Microseeds Publishing, 7030-B W. Hillsborough Ave., Tampa, FL 33634. (813) 882-8635. (July '89)

Retrospect ★★★★½

Retrospect is a full-featured backup-and-archival package that supports storage devices from floppies to DAT drives. Version 1.1 adds significant performance for SCSI devices, most notably tape drives. Version 1.1. Requires Mac Plus and System 6.0 or later. $249. Dantz Development, 1510 Walnut St., Berkeley, CA 94709. (415) 849-0293. (Dec '89) ★'89 Eddy

Shadow ★★★½

Shadow is a DA that automatically backs up selected files at specified time intervals and after specified actions. Version 1.24. Requires Mac 512KE or later. $49.95. Natural Intelligence, 86 Richdale Ave., Cambridge, MA 02140. (800) 999-4649 or (617) 266-7858. (May '90)

• File/Disk Management

Boomerang ★★★★★

Boomerang is a handy INIT that adds full navigational and search features to all Open and Save dialog boxes. It automatically remembers all the files and folders recently accessed and can be configured to always show certain files and folders. It can save you a lot of time, and it's shareware! Version 2.0. Requires Mac Plus or later. $30, shareware. Zeta Soft, 2425B Channing Way, Suite 492, Berkeley, CA 94704. Also available for download on Zmac and other on-line services. (Apr '90)

CanOpener ★★★★½

CanOpener searches files at a decent clip for specified strings. Can read and display text, MacPaint, PICT, EPS, TIFF, RIFF, and MacDraw II formats. The interface looks odd but is quite easy to master. Version 1.1. Requires Mac Plus or later. $125. Abbott Systems, 62 Mountain Road, Pleasantville, NY 10570. (800) 552-9157 or (914) 747-3116. (Feb '90) ★'89 Eddy

Disk Doubler ★★★★½

Disk Doubler is an INIT that adds a menu with file-compression and -expansion options to all your applications. It is very efficient and generally compresses files smaller than StuffIt does. Includes an application that lets compressed files be expanded with a double-click. The ability to read StuffIt files is promised for a future version. Version 2.0.4. $59.95. Salient Software, 3101 Avalon Court, Palo Alto, CA 94306. (415) 852-9567. (July '90)

DiskExpress II ★★★★★

DiskExpress II is much quicker and better than its predecessor, DiskExpress. It is by far the best hard-disk optimizer (or defragmenter) available. It can be set to run automatically, in the background, at a preset time, or manually. DiskExpress II is capable of several levels of optimization, and when it's used judiciously, it does a perfect job. Version 2.04. $89.95. ALSoft, P.O. Box 927, Spring, TX 77383-0927; (713) 353-4090. (July '90)

DiskFinder ★★½

DiskFinder searches disks for files and also catalogs disks. Version 1.07. Requires Macintosh 512KE or later. $49.95. Williams & Macias, S. 3707 Godfrey Blvd., Spokane, WA 99204. (800) 752-4400. (Feb '89)

DiskTop 4.0 ★★★★★

DiskTop 4.0 is the best Finder-replacement DA. It's very easy to use, is very powerful, and has an excellent interface. The Find function's multiple options are unmatched, and it's very fast. It can launch applications and perform batch copies and moves. Version 4.0. Requires Mac Plus or later. $99.95. CE Software, P.O. Box 65580, West Des Moines, IA 50265. (515) 224-1995. (June '90)

FetchIT ★★★★½

FetchIT is an INIT that puts a pop-up menu onto the small disk icon on the right side of the Open and Save dialog boxes. This menu can be used to navigate your disks or do other Finder-type operations. Performance is good. Although you lose the ability to move up a directory level by simply clicking on the icon, you gain far more in return. Version 2.01. Requires Mac Plus or later. $25. CRA Z Software, P.O. Box 6379, Haverhill, MA 01831. (508) 521-5262. (June '90)

Findswell ★★★★★

Findswell is an indispensable utility that installs a new button in the Open dialog box of virtually every Mac application. Press the button, type a search string, and click on Find, and Findswell searches for any files that match. Click on Open, or double-click to open the correct file. Version 2.0. Requires Mac 512K or later. $59.95. Working Software, P.O. Box 1844, Santa Cruz, CA 95061. (408) 423-5696. (Nov '87) ★'87 Eddy

HandOff ★★★★½

HandOff solves the annoying problem of not having the exact application to open a document. It lets you specify, for example, that Word should open all documents created by MacWrite. Slick. Version 1.1. Requires Mac Plus or later. $49.95. Software Innovations, P.O. Box 811, Allen, TX 75002. (214) 727-2329. (Feb '90)

INITPicker ★★★★½

INITPicker offers a scrollable list of INITs in the System to let you determine their loading order. Holding down a predetermined key combination at startup automatically shuts off all INITs and bypasses the INITPicker screen. Version 1.01. Requires Mac Plus or later. $49. Microseeds, 7030-B W. Hillsborough Ave., Tampa, FL 33634. (813) 882-8635. (Aug '89)

Inix ★★½

Inix is a combination INIT and DA that lets you choose separate startup sets. It does not let you decide to turn off a set temporarily (until the next startup), and it lacks the "run all" or "skip all" commands found in Aask and INITPicker. Version 1.1. Requires Mac 512K or later. $49.95. Natural Intelligence, 86 Richdale Ave., Cambridge, MA 02140. (617) 266-7858. (Aug '89)

MacTREE Plus ★★★½

MacTREE Plus displays your files in the form of a hierarchical tree. Can't view tree easily. Good search function. Version 2.0. Requires Mac 512K or later. $69.95. Go Technology, 918 Northwood Blvd., Second Floor, Incline Village, NV 89450. (702) 831-3100. (Apr '88)

MultiDisk ★★★★

MultiDisk is an excellent software disk partitioner that allows partitions to be resized dynamically, password-protected, and even encrypted. Version 1.2. Requires Mac 512K or later. $69.95. ALSoft, Inc., P.O. Box 927, Spring, TX 77383-0927. (713) 353-4090. (May '89)

On Cue ★★★★½

On Cue lets you switch applications without returning to the Finder. Under MultiFinder, active applications are listed on a pop-up menu. Can also launch directly to a specific document. Version 1.3. Requires Mac 512K or later. $59.95. ICOM Simulations, 648 S. Wheeling Road, Wheeling, IL 60090. (708) 520-4440. (Sept '88)

On Location ★★★★

On Location finds files and text strings. That's it. Once it's found a file, you can view the contents (for most common document formats); open it in its native application; or copy, delete, rename, or move it. This is no DiskTop, though.

On Location's main asset is blazing speed, which it gets from the index file it builds on your hard disk at installation. The index is updated either automatically or on command, and you can move the index file and use it on another disk if you wish. Mac purists will cringe at the nonstandard interface. Expensive for a one-trick utility, but there's a one-year money-back guarantee. Version 1.0. Requires Mac Plus and a hard-disk drive. $129.95. ON Technology, One Cambridge Center, Cambridge, MA 02142. (617) 225-2545. (Aug '90)

POWERicons ⚡⚡⚡⚡

POWERicons creates duplicate icons for applications to make hard-disk-drive organization easier and more efficient. POWERicons can also be created to open sets of frequently used icons by double-clicking. Version 1.03. Requires System 4.2 or later. $79.95. Magic Software, 1602 Cascio Drive, Bellevue, NE 68005. (800) 342-6243 or (402) 291-0670. (Feb '90)

POWERmenus ⚡⚡⚡⚡⚡

POWERmenus is two products in one. The first allows full access to menus from anywhere on-screen. The second, called Gadgets, includes a phone dialer; notepad; and useful application, DA, and Control Panel-item launchers. Version 1.03. Requires System 5.0 or later. $79.95. Magic Software, 1602 Cascio Drive, Bellevue, NE 68005. (402) 291-0670. (Jan '90)

Sector Collector ⚡⚡⚡⚡

Sector Collector is a small utility that scans your disks, looking for bad or marginal media. It collects problem areas in a file so they aren't used for other storage. It can eventually prevent you from losing files due to bad disk media. Version 1.0. Requires Mac 512KE or later and System 4.2 or later. $49.95. 1stAid Software, 42 Radnor Road, Boston, MA 02135. (617) 783-7118. (Feb '90)

SilverLining ⚡⚡⚡⚡½

SilverLining is an advanced hard-disk-utility set. It has the best disk-partitioning software and can format most hard-disk drives. It has powerful and safe optimizing and testing features. Excellent performance. Also includes DS Backup, acceptable backup software, and a nice disk duplicator. Version 5.25. Requires Mac Plus and SCSI device. $99.95. La Cie, Ltd., 19552 S.W. 90th Court, Tualatin, OR 97062. (800) 999-0143 or (503) 691-0771. (Jan '90)

StuffIt ⚡⚡⚡⚡⚡

StuffIt can compress files to reduce the amount of space they occupy on-disk. Great for transferring documents via modem. Also joins and encrypts files. Version 1.5.1. Requires Mac 512KE. Shareware fee, $25. Aladdin Systems, Inc., Deer Park Center, Suite 23A-171, Aptos, CA 95003-4723. (408) 685-9175. (Dec '88)

XTreeMac ⚡⚡

XTreeMac is a file-management utility that uses a file-card metaphor. Can recover deleted files, and supports filters for grouping specified types of files. Not for network use. Buggy. Version 3.0. Requires Mac 512KE or later and System 4.2 or later. $99. XTree Co., 4330 Santa Fe Road, San Luis Obispo, CA 93401. (805) 541-0604. (Sept '89)

•PRINTING

Grappler Spooler ⚡⚡⚡

Grappler Spooler is an adequate spooler but no speed demon. Installation is simple, and there are few problems, but sometimes using it is slower than not using a spooler. It lacks laser-printer support. Version 1.0. Requires Mac Plus or later and QuickDraw printer. $79. Orange Micro, 1400 N. Lakeview Ave., Anaheim, CA 92807. (714) 779-2772. (Apr '90)

JetLink Express ⚡⚡⚡

JetLink Express is a printer driver that lets you print to non-PostScript HP printers. Provides a set of four special outline fonts that it automatically uses when you choose the standard Adobe fonts. Includes cable. Terrible manual. Check application compatibility before buying. Version 1.1. Requires Mac Plus; System 6.0 or later; hard-disk drive; 512K printer memory (1 megabyte recommended); and LaserJet IID, LaserJet II series, LaserJet Plus, DeskJet Plus, DeskWriter, DeskJet, or HP-compatible printer. $149; additional fonts, $198. GDT Softworks, P.O. Box 1865, Point Roberts, WA 98281-1865. (604) 291-9121. (Jan '90)

MacPrint ⚡⚡⚡

MacPrint is a printer driver that lets you print to non-PostScript HP printers. Provides screen fonts for every imaginable HP font cartridge and special Compugraphic screen fonts. Good manual. Check application compatibility before buying. Version 1.2. Requires Mac Plus; System 6.0; hard-disk drive; 512K printer memory (1 megabyte recommended); and LaserJet IID, LaserJet II series, LaserJet Plus, DeskJet Plus, DeskJet, or HP-compatible printer. $149. Insight Development, 2200 Powell St., Suite 500, Emeryville, CA 94608. (415) 652-4115. (Jan '90)

PrintBar ⚡⚡⚡⚡½

PrintBar calculates and prints bar codes at varying resolutions. It supports UPC, EAN, 2 of 5, and Code 39. You get the application and the necessary fonts, including printer and screen fonts where required. Operation is a bit clunky, but performance is fine. Output is easily transferable. Version 2.0. Four volumes (for different codes), $225 each; discounts for buying multiple volumes. Bear Rock Software, 6069 Enterprise Drive, Diamond Springs, CA 95619. (916) 622-4640. (June '90)

SuperLaserSpool ⚡⚡⚡⚡

SuperLaserSpool supports the widest range of printers (it's the only spooler to support the DeskWriter) and has generally excellent performance. The installation is a snap, and use is mostly transparent. Support is excellent. Version 2.02. Requires Mac Plus or later. $149.95. Fifth Generation Systems, 10049 N. Reiger Road, Baton Rouge, LA 70809. (504) 291-7221. (Apr '90)

SuperSpool ⚡⚡⚡½

SuperSpool is the simpler of the two SuperMac spoolers. It's often slightly quicker than SuperLaserSpool. Excellent support. No laser-printer support. Version 5.0. Requires Mac Plus or later and QuickDraw printer. $99.95. SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202. (Apr '90)

TScript ⚡⚡⚡½

TScript, like Freedom of Press, makes non-PostScript printers PostScript-compatible. It also lets you preview EPS files and PostScript code. If you apply some effects to any font other than Times, Helvetica, or Courier, the eventual printed output can suffer from the jaggies. Speed is good. Limited capabilities make it preferable to Freedom of Press only for those on a tight budget. Version 1.2. $145. TeleTypesetting, 474 Commonwealth Ave., Boston, MA 02215. (617) 734-9700. (Aug '90)

•SECURITY

Advanced Security ⚡⚡⚡⚡

Advanced Security consists of three applications: File Security, which can automatically protect your work; HD Security, which locks hard disks so they can be opened only by a special floppy; and Virus Security, which simply checks itself for changes when it's run. Virus Security lacks real value these days. HD Security is fine as long as nothing happens to the floppy disk. Version 1.2. Requires Mac Plus or later. Single-user version, $149.95; multiuser versions available. Advanced Gravis Computer Technology, 1602 Carolina St., Suite D12, Bellingham, WA 98226. (800) 937-0062 or (604) 434-7274. (May '90)

DiskLock ⚡⚡⚡½

DiskLock has two parts: an INIT and an application called FolderLock. It has standard locking features and is controlled by a DA. DES is not supported. This is basic security, neither great nor awful. Version 1.0.1. Requires Mac Plus or later. $189. Fifth Generation Systems, 10049 N. Reiger, Baton Rouge, LA 70809. (800) 873-4384. (May '90)

FileGuard ⚡⚡⚡⚡½

FileGuard is a cdev that operates primarily in the background. It offers varying levels of access and very intelligent controls. It is unique in that it can protect applications as well as data. Overall, it is an excellent security tool. Version 2.0.2. Requires Macintosh Plus or later. $249. ASD Software, 4650 Arrow Highway, Suite E-6, Montclair, CA 91763. (714) 624-2594. (May '90)

Ft. Knox ⚡⚡⚡⚡½

Ft. Knox offers a nice mix of security utilities. Supports two forms of encryption, and files or volumes can be "sanitized" to U.S. top-secret standards. Version 1.05. Requires Mac 512K or later. $195. Transfinite Systems Co., P.O. Box N, MIT Branch Post Office, Cambridge, MA 02139-0903. (617) 969-9570. (Nov '89)

NightWatch ⚡⚡⚡

NightWatch locks up your hard-disk drive by using a floppy startup disk that acts as a key. Type in the correct password, and access to the hard-disk drive is allowed. Version 1.03. Requires Mac 512KE, a hard-disk drive, and an 800K drive. Mac II and MultiFinder friendly. $149.95. Kent Marsh Ltd., 1200 Post Oak Blvd., Suite 210, Houston, TX 77056. (800) 325-3587. (Sept '88)

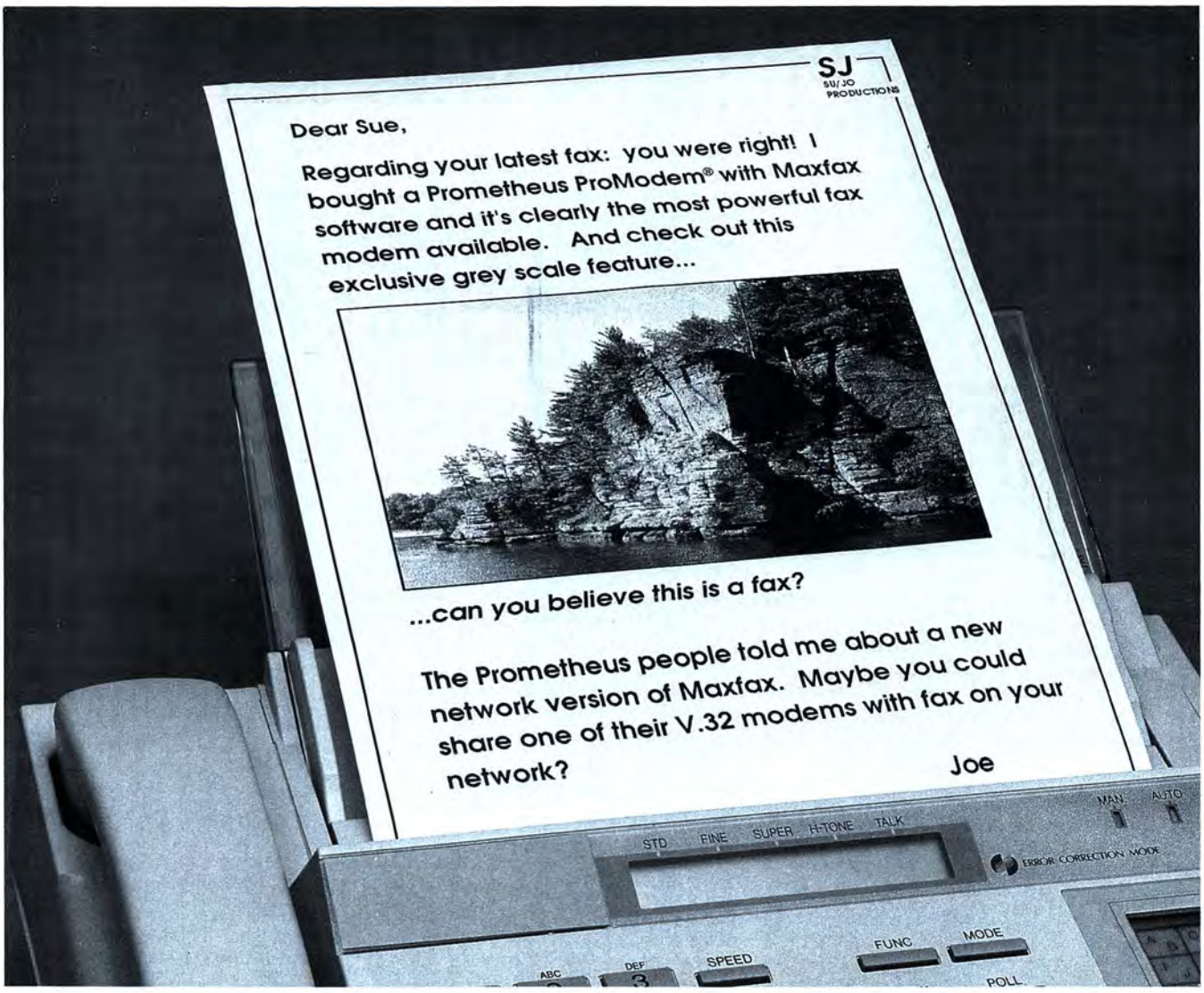
SecureInit ⚡⚡⚡⚡

SecureInit is a well-thought-out program that can lock files and folders, make the System Folder invisible, erase files not on its user-specified approved list, lock disks after use, refresh (replace) specified files with clean copies after use, and password-protect everything. It can also purge files as a disk fills up, but this is too dangerous a feature to use in most cases. SecureInit is particularly good at resisting efforts to bypass it. Version 2.2. $99.95. Direct Software, 1032 Irving St., Suite 513, San Francisco, CA 94122. (415) 347-1590. (Aug '90)

Sentinel ⚡⚡⚡⚡

Sentinel encrypts data files (or sets of files), using a super-secure DES or a superfast SuperCrypt algorithm. Provides high-level security if you can keep your passwords secret. Version 2.0. Requires Mac 512KE or later. $149. SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202. (Apr '88)

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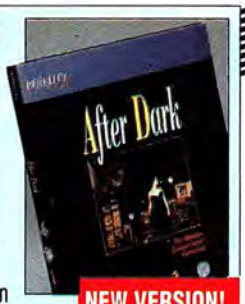
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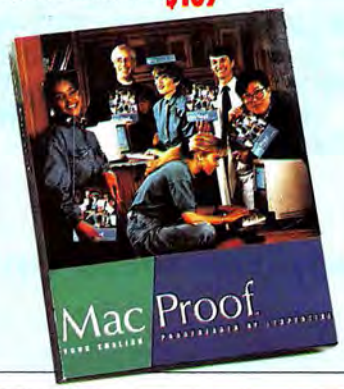
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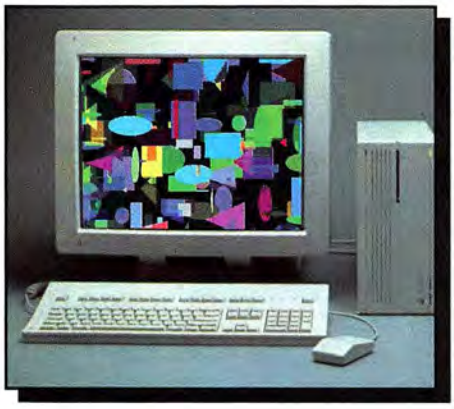
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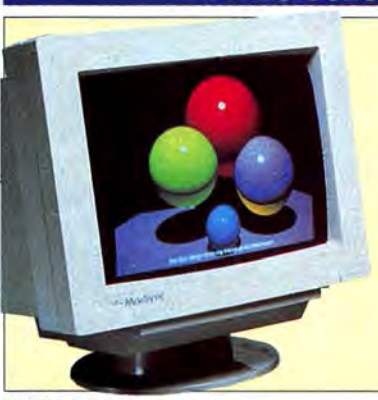
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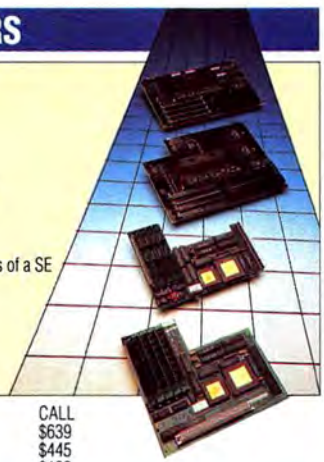
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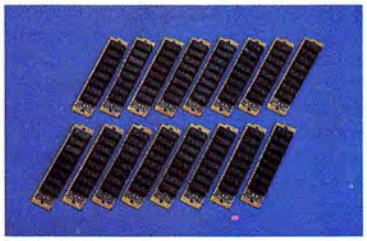
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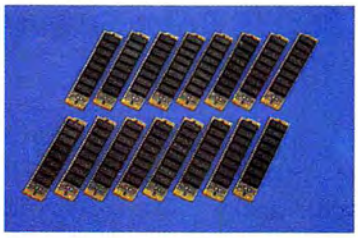
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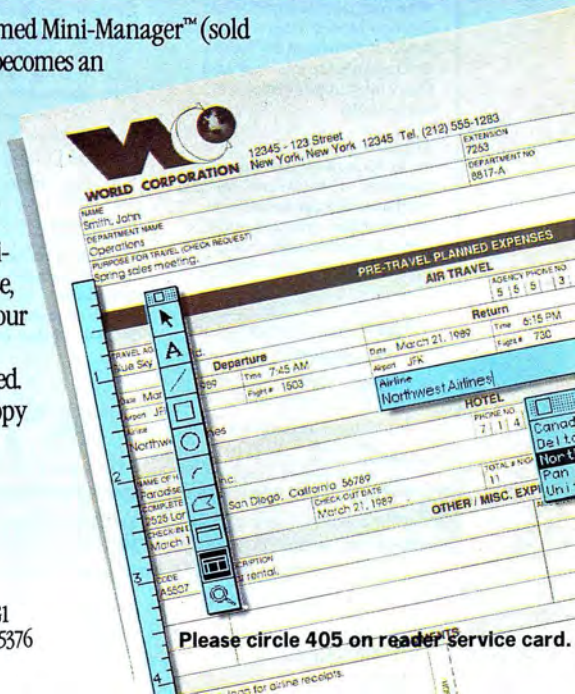
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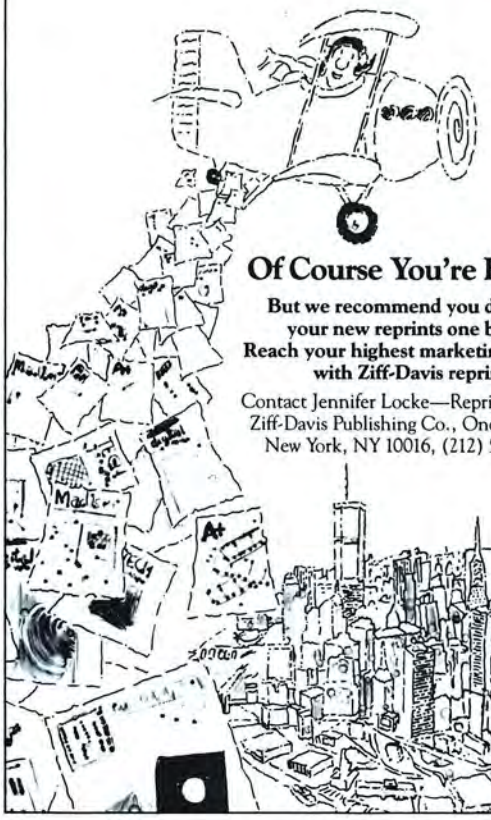
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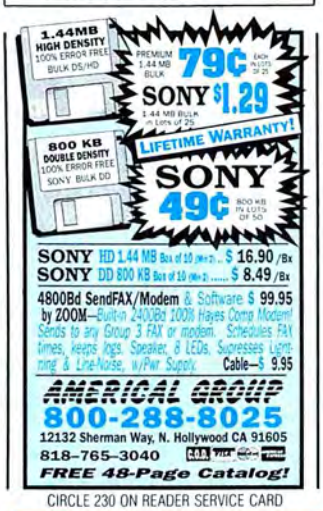
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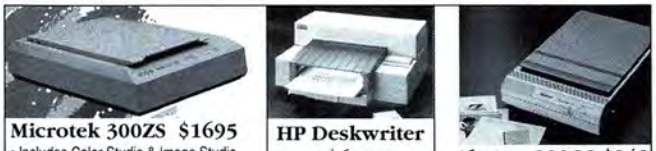
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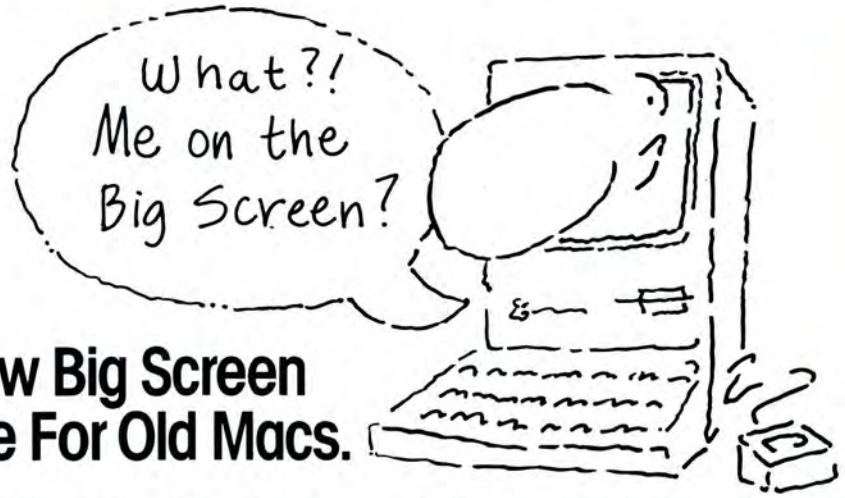
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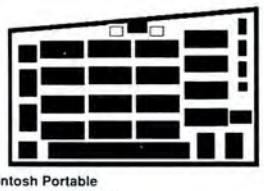
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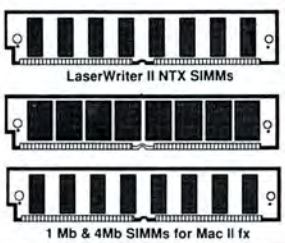
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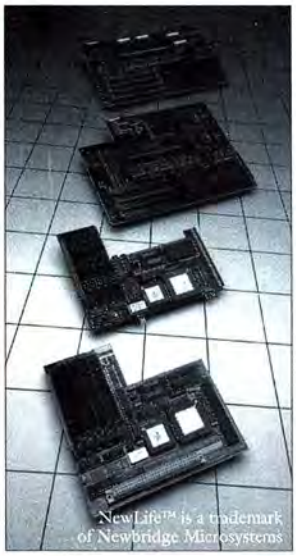
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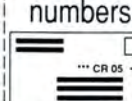
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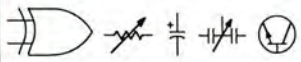
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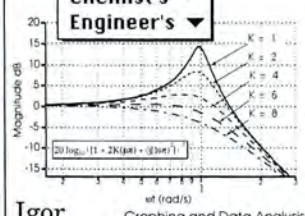
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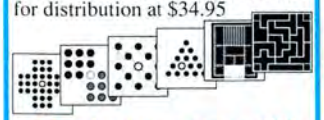
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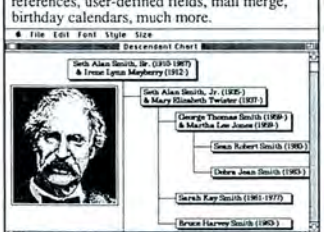
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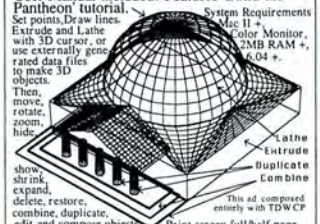
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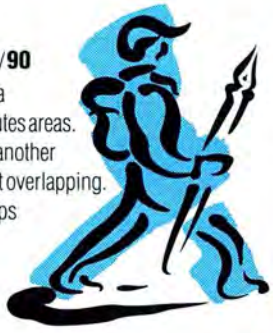
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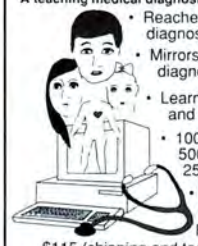
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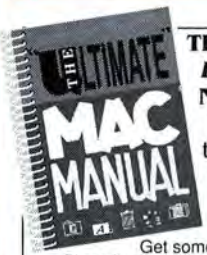
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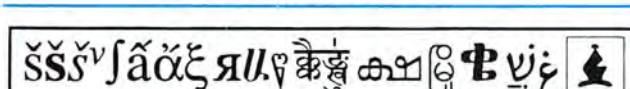
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Five More Years of Griping



The genial author of so many Apple-bashing columns explains why Apple continues to earn his ire, even after producing such masterpieces as the IIfx.



MacUser is beginning its sixth year of publication. Only Lisa Orsini, the art director, contributing editor Steven Bobker, and I, Mr. Anti-Editor, remain from the original masthead, but the magazine is on pretty much the same path it set in the first issue in October 1985.

Within that issue was a wad of fawning articles telling the then-insecure Mac users that they weren't idiots for buying a machine that did very little. Accolades and new *MacUser* subscriptions rewarded any effort that helped keep those early buyers away from the thought that they had really been suckered by Steve Jobs (and his "insanely great" flimflam).

I was brought to the magazine as part of the original formula because I was a known grumpmeister who could throw a wet blanket on any shindig (although in real life I'm a jovial, carefree kind of guy). The founding publisher, Felix Dennis, a swinging rich guy from Britain (who in real life is a curmudgeon but doesn't want anyone to know), decided that there was too much rah-rah in the Mac community and that the least *MacUser* could do was put a professional complainer into the magazine to prove it wasn't a bunch of lackeys for the Apple PR department.

I started off with a bang by describing the Mac as a "wimp" computer designed for the effete user. This began the tradition of monthly hate mail aimed at me and my column.

But in early 1986, the possibility existed that the Mac would never make the grade. All the insiders knew it. The previous April, Steve Jobs had been removed as Mac manager during a spat with Sculley as Mac sales tumbled to 20,000 a month (Sculley had reverted to a pathetic childhood stutter during this dark time). It would still be a few years before the Mac was for real. I felt it was the unmanly aspects of the machine — its gestalt — that was hurting sales more than anything. But the NuBus-based Mac II took care of that. It marked the turnaround for Apple.

As cute as the dinky wimp Mac was, it never stirred the soul as the big kick-butt Mac II box did. I knew when the Mac II was introduced that I'd have to change my anti-editor tune, since most of my oft-repeated complaints were now null and void. When Steve Jobs completely departed to join forces with right-wing Texas billionaire H. Ross Perot, I couldn't even make fun of his wacky antics anymore.

So I switched the target of the Devil's Advocate column from the machine to the company, which has failed to change how the general public perceives it. Especially now that — with the introduction of the Mac IIfx — Apple hardware technology has finally caught up with its software technology. Its software was always too good for the sluggish Mac I engine. If you liked to wait for something to happen, then the Mac was for you.

That's no longer true, but the negative perception hasn't changed. None of this is helped by the price of Mac computers or by a cheap imitation of the Mac OS called Windows 3.0, an MS-DOS shell program that makes IBM PC clones seem kinda like the Mac.

Now IBM is sneaking into the fray with an overpriced cheap-looking machine called the PS/1 to try to muscle out the ubiquitous Apple II from the school systems. The Mac should have muscled out the Apple II altogether years ago, but because Wozniak and the Apple II-division coasters made such a stink about how Apple II sales saved the company in late 1984, the machine has been maintained and even kludged into the IIGS upgrade.

Now, if Apple wised up and put the IIGS onto five or six VLSI chips, lowballed it for $299 right into the teeth of the PS/1, and regained the educational and "home" market, I would figure they knew what they were doing. Nintendo is selling $3 billion a year worth of bozo game boxes — Apple blew it here. Why didn't Apple turn the old 64K Apple II into such a box to sell for $150 or less? The potential was incredible.

If, however, you read Sculley's book, *Odyssey*, you'll discover that Sculley has long since given up on the idea that you can market a consumer-oriented computer. Recent history has shown that his orientation seems to be the lure of the upscale "workstation." Then again, according to the original Apple business plan set forth by Apple's real visionary, chain-smoker Mike Markkula, the idea was to "rifle-shot the hobby market as the first stepping stone to the major market." What's the major market for computers? Business. People with big budgets who can afford the high price of a workstation. Heaven forbid the idealistic goal of computerizing all mankind for the good of the world. Let someone else do it.

Well, Apple has managed to rifle-shot its way past a slew of opportunities and right into the minicomputer market. Oh, boy! The next five years will be a load of laughs.



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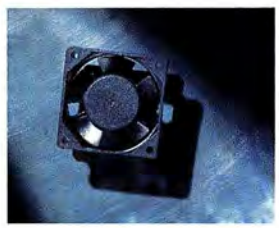
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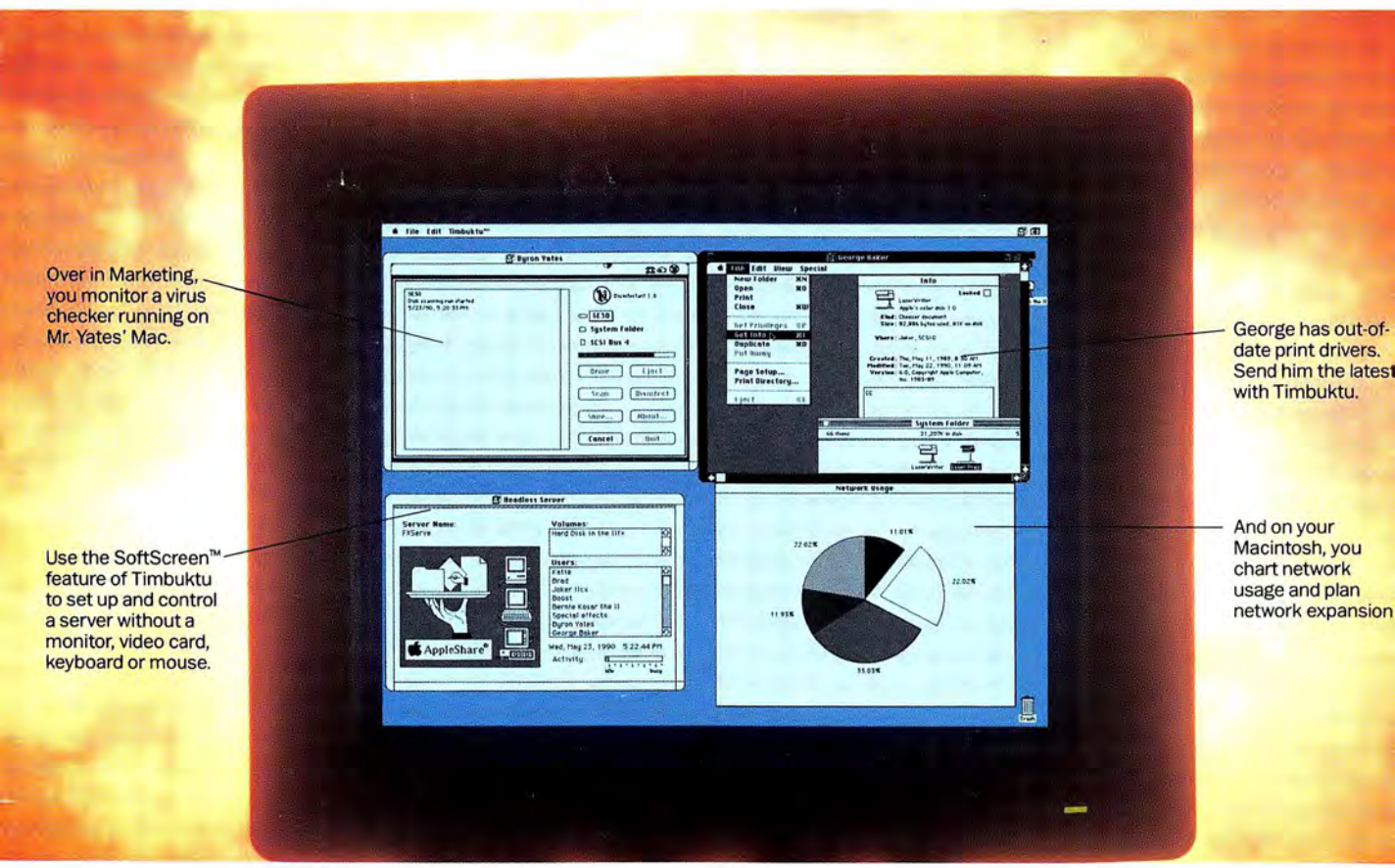


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